EXCLUSIVE! **P-51 AND P-47 RESTORATIONS**



October 2023
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AEROPLANE

HISTORY IN THE AIR SINCE 1911

HURRICANE HEROES

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COVER IMAGE: The Historic Aircraft Collection's Hurricane XII in the recently applied markings of No 302 (Polish) Squadron. DARREN HARBAR



From the Editor

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It came, sadly, as little surprise to discover during August that the last British Airways Boeing 747-400 to fly, the BOAC 'retro'-liveried G-BYGC, was being dismantled at St Athan. When the aircraft was retired in 2020, the carrier's chief executive Sean Doyle was quoted as saying, "While we will miss seeing them grace our skies, we are delighted to have found permanent homes for our remaining centenary 747 aircraft. We think they have great historical importance, not only to British Airways but to the entire aviation industry, and we are pleased they will be preserved for future generations in locations in the UK". The others, of course, were the example in the 'Negus' colour scheme, G-CIVB, which survives as an event venue at Cotswold Airport, and the one in 'Landor' livery, G-BNLY, kept at Dunsfold as a filming location. By contrast, G-BYGC's owner eCube said hopes of preserving its 747 had been rendered "unattainable" as a result of "the limitations of moving the aircraft to a safe, non-airside location". Parts were being made available for sale.

> ***"Always airliners have struggled in the preservation world"***

The upkeep of any aircraft like that as a complete entity is a simply enormous undertaking. Nearly half a million pounds went into preparing the Kemble 747 for its new role hosting corporate and private events. eCube can hardly be blamed for its decision regarding the BOAC 'retrojet'. But it brought to mind thoughts of the UK's prime collections of large commercial aircraft, and how many of them still reside out of doors. Both the Brooklands Museum and the Duxford Aviation Society have made splendid efforts over the years to keep their respective charges in tip-top condition. They have done so outside the framework of the UK's national collections, which may have their own financial pressures in the current climate, but which benefit significantly from government funding. Always civil airliners have, as we're all too well aware, struggled in the preservation world despite their industrial and social significance. The practical factors involved are obvious — large ex-military aircraft have often been forced to sit outside, too. But far more of them have found homes under cover than their civil counterparts. As such an important part of our national heritage, that deserves to change.

Incidentally, on the subject of our state-owned collections, I tried to find on the RAF Museum Midlands website whether any reference is still made to the Test Flight hangar among its main list of attractions. None was to be seen. I did, however, find a link to a page entitled 'Midlands Aircrafts'. Ugh. Such glaring, entry-level mistakes seem to be increasingly common across our national museum sector. Is it too much to ask for the exhibition of some basic knowledge and sympathy with the subject matter? Compared with recent news stories surrounding the British Museum, this is pretty small beer. But, even so, our particular portion of the heritage sector deserves better.

Ben Dunnell

CONTRIBUTORS THIS MONTH

TONY BUTTLER



Spending nearly two decades involved in the testing of aluminium and titanium airframe and engine components for the world's major aircraft, Tony's great interest in military aeroplanes grew, particularly when it came to their design and development. Having studied for a master's degree at Loughborough University in 1995, he has since been a freelance aviation historian, with many books and articles to his name. For this issue of *Aeroplane* he contributes our Database on the deadly de Havilland DH108.

JOHN CHADWICK



John started his working life as a mining engineer in Zambia, but most of his career was as a global editor on mining business-to-business magazines, for which he wrote literally hundreds of articles. He launched *International Mining*, owned by his company TEAM Publishing, 12 years before retirement. The magazine is still going. Retiring in 2018, he travels widely and writes on aviation history. He also has an African novel — around life journeys involving diamond mining and poaching — ready to be published.

CHUCK CRAVENS



After a teaching and coaching career spanning 34 years, Chuck began a job that embraced his lifelong passion for aviation. He is the historian and author at AirCorps Aviation in Bemidji, Minnesota, and this month recounts the restoration stories of P-47D Thunderbolt *Bonnie* and P-51C Mustang *Thunderbird*. Researching and writing about the warbirds which are restored there is a labour of love for Chuck. He considers it a great honour to keep alive the history of the aeroplanes and those who built, maintained and flew them.

JENNY GRANT



Jenny is a postgraduate researcher studying the challenges of integrating the Polish armed forces in the UK into the Western Allied military effort. After graduating from Oxford with a degree in modern history, she moved to the School of Slavonic and Eastern European Studies to complete her MA. She has written a number of articles and appeared on several podcasts, as well as presenting talks on the Polish Air Force and the 1st Polish Armoured Division, speaking at IWM Duxford and the Chelsea History Festival.

AEROPLANE ESTABLISHED 1911

Aeroplane traces its lineage back to the weekly *The Aeroplane*, founded by C. G. Grey in 1911 and published until 1968. It was relaunched as a monthly in 1973 by Richard T. Riding, editor for 25 years until 1998.



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Government Aircraft Factories (GAF) Canberra Mk.20, A84-240 is a Royal Australian Air Force aircraft of that fought in both the Malayan Emergency and the Vietnam War on secondment to the United States Air Force. The aircraft was operated by RAAF No.2 Sqn, know as 'The Magpies'. A84-240 survived and is today proudly maintained and preserved at The Air Force Museum of New Zealand. This release marks the return of the Canberra tooling to the Aviation Archive range for the first time in sixteen years, and is the first time Corgi has modelled a RAAF version of the type.

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With Pete Kynsey at the helm, the W Aircollection's P-51D Mustang 45-11518/G-CLNV gets airborne for its maiden post-rebuild flight at Sywell on 25 August. GEORGE LAND

Rebuilt Mustang flies at Sywell

On 25 August, North American P-51D Mustang 45-11518/G-CLNV flew again at Sywell, Northamptonshire with Pete Kynsey at the controls, following restoration by Air Leasing. Owned by the W Aircollection in Paris, once flight-testing is complete the aeroplane will move to its new base at La Ferté-Alais, where it will join the W Aircollection's other Second World War fighter, Supermarine Spitfire XIV RM927.

The Mustang has been painted in the markings of the 74th Fighter Squadron, which was part of the 23rd Fighter Group, 14th Air Force, operating in the China-Burma-India theatre towards the end of the war. It is understood it may be repainted in France over the winter.

Enthusiasts in the UK will remember the fighter as G-MSTG, which Maurice Hammond operated from Hardwick, Suffolk. Purchased by Hammond from Sir Tim Wallis in New Zealand, restoration began at Maurice's workshop at Eye in September 1997, the fighter taking to the air again at Hardwick on 14 July 2001 as '414419/LH-F' with the name *Janie*. It was a regular participant in events until 2 October 2016, when the Mustang crashed on landing at Hardwick, Hammond being seriously injured and the back-seat passenger killed. The aircraft was subsequently acquired by Fighter Aviation Engineering, but during June 2023, as the rebuild neared conclusion, it was registered to the W Aircollection.

> ***"Once testing is complete it will move to La Ferté-Alais"***

Serial 45-11518 was originally shipped to New Zealand in August 1945 and gained the Royal New Zealand Air Force serial NZ2427. With the war over, it went into storage, remaining there until 1952. Sold off in 1958, the P-51 was bought by Sir Tim Wallis of the Alpine Fighter Collection at Wanaka as a long-term restoration project during 1990.



Addison Pemberton flying the world's only airworthy N3N-3 floatplane near Spokane, Washington State, in late August. MOOSE PETERSON

Float N3N-3 flies again

On 24 August the only airworthy float-equipped Naval Aircraft Factory N3N-3, N45136, made its first water landing since its return to flight was completed by Addison Pemberton and his team at Felts Field, Spokane, Washington State. Restoration of the former US Navy trainer, c/n 1953, took more than 2,500 hours with the aid of volunteers. The machine clocked up barely 200 hours of flight while serving with the US Navy, and after being retired the intention was to convert it into a crop-sprayer, but that never came to pass and the aircraft spent decades stored in a barn. Addison Pemberton intends to operate the machine on floats every summer, and during the winter months will fly it from Felts Field on wheels.

ORION FOR RNZAF MUSEUM

On 16 August, the Air Force Museum of New Zealand announced that the latest addition to its collection, Lockheed P-3K2 Orion NZ4203, will arrive at its Wigram site during early September. Built by Lockheed in Burbank, California during 1966, NZ4203 entered service with the RNZAF in April 1967. It notched up more than 27,000 hours during its illustrious 54-year career. In 2021 the aircraft became the first of the type to retire from New Zealand service when it flew a farewell mission to land at RNZAF Base Woodbourne.

Air Force Museum of New Zealand director Brett Marshall said, "NZ4203 was the first RNZAF Orion to land in Antarctica back in 2006. It has also taken part in numerous humanitarian and search and rescue missions and has been a lifesaver for many people who have found themselves needing help a long way from home."

NZ4203 served with No 5 Squadron at RNZAF Base Whenuapai and was regularly upgraded to extend its life-span, receiving new avionics and radio systems in the 1980s and new wings the following decade. The aircraft was decommissioned at RNZAF Base Woodbourne in Blenheim and will arrive at the museum by road. There it will be stored initially in the reserve collection hangar. "Our current exhibition halls are too small to accommodate it, so we're busy working on plans for a new space to exhibit it", Brett Marshall added. The Orions have been replaced by a fleet of four Boeing P-8A Poseidon maritime patrol and reconnaissance machines.



The Air Force Museum of New Zealand's latest acquisition, P-3K2 Orion NZ4203, which was due to arrive at Wigram in early September following a 54-year career. RNZAF

Grimminger bags Hangar 10

On 28 July, it was announced that the Hangar 10 collection of historic Second World War German aircraft has been acquired by Munich-based collector Karl F. Grimminger. The fleet will remain at its base at Heringsdorf airfield on the Baltic Sea island of Usedom, where Hangar 10 was founded by Volker Schülke, who was tragically killed in a Pilatus P2 on 2 July 2020.

Karl Grimminger already owns the Luftraum Süd aviation collection, which is housed in a new hangar at Aalen, 43 miles east of Stuttgart. Among its exhibits are Hawker Hurricane XII 'AG244'/G-CBOE and de Havilland Fox Moth G-ACEJ. Hangar 10 will now become Luftraum Nord at Usedom, and includes a Messerschmitt Bf 108, Bf 109 G-6 and G-14, a Flug Werk FW 190 A-8/N, Fieseler Fi 156 Storch, a Bücker Bü 131 Jungmann and Bü 133 Jungmeister. The sale of the fleet was brokered by Boschung Global.



Hangar 10's Messerschmitt Bf 109 G-14, D-FMGV, now part of Karl Grimminger's extensive fleet. HUW HOPKINS



Jaguar GR1 XZ383 after its arrival at Elvington for the Yorkshire Air Museum on 5 August. GRAHAM BUCKLE



The 'raspberry ripple' Jaguar T2, XX145, being loaded up at Cosford ready for its move to Old Sarum. CROWN COPYRIGHT

MUSEUMS GET COSFORD JAGUARS

Two SEPECAT Jaguars, previously used for ground instructional duties at RAF Cosford, left their long-term home at the Shropshire base during August for museums. First to go was GR1 XZ383, which arrived with the Yorkshire Air Museum at Elvington on 5 August. It had been in use with No 1 School of Technical Training at Cosford from October 1986 until being moved into external storage in early 2023. XZ383 first flew on 11 March 1977, being delivered to No 14 Squadron at Brüggen the following month. During 1985 it was sent to Coltishall for assignment to No 41 Squadron.

On 24 August, Jaguar T2 XX145 arrived at the Boscombe Down Aviation Collection's base at Old Sarum, Wiltshire. The 'raspberry ripple'-liveried machine saw extensive use at Boscombe Down with the Empire Test Pilots' School before being retired during 2006. It was originally built as a GR1 and delivered to the RAF in 1974, before conversion to T2 configuration.

Firefly back to Duxford

Fairey Firefly I Z2033 returned to IWM Duxford on 17 August, following a 23-year loan period with the Fleet Air Arm Museum at Yeovilton. Although it was displayed in the public exhibition areas at Yeovilton for some time, latterly it had been in storage in the museum's Cobham Hall facility. With the FAA Museum's Firefly TT4, VH127, also having been in the Cobham Hall for many years, Z2033's arrival back at Duxford sees the welcome return of an example of this charismatic strike-fighter to public display in the UK.



Firefly I Z2033 being unloaded at Duxford on 17 August following the road trip from Yeovilton, the play-on-words *Evelyn Tensions* name visible on the cowling. IWM

Built at Fairey Aviation's satellite factory in Hayes, Middlesex during early 1944, Z2033 was delivered to 731 Naval Air Squadron at RNAS East Haven, five miles south-west of Arbroath, Scotland during March 1945. During August of that year, Z2033, with Lt R. E. Patterson at the controls, taxied into a parked vehicle, damaging the starboard wing. Following repairs with Fairey at its Hamble, Hampshire works, and later at Ringway, Lancashire, test pilot Albert Eyskens performed a test flight on 1 April 1946.

Between April 1946 and September 1948, Z2033 saw service in several different trials at airfields across Britain, taking part in the post-war Firefly trainer development programme at Ringway and later at Boscombe Down with the markings G-6-3, serving as a mock-up and a spin trials airframe. When Fairey decided it no longer required the aircraft, Z2033 was converted to target-tug configuration during 1948 and sold to Svensk Flygtjänst in Stockholm, Sweden. Delivered as SE-BRD on 15 February 1949, it was operated for the next 14 years until making a forced landing at Karlsborg on 17 October 1963 due to an oil leak.

The repaired Firefly was ferried to Torslanda on the east coast of Sweden and retired. Acquired by Peter Thomas for his Skyfame Aircraft Museum at Staverton, it was flown to the Gloucestershire airfield on 28 May 1964 and maintained in taxiable condition for many years until being obtained by the Imperial War Museum, along with most of the Skyfame collection, in 1978.

During the late 1980s/early '90s it was restored to its original configuration as a MkI and repainted to represent Firefly DK431 *Evelyn Tensions* of 1771 Naval Air Squadron, embarked on HMS *Implacable*, from which carrier the Fleet Air Arm's Fireflies were the first British aircraft to fly operational missions over Tokyo in 1945. It wears the fuselage code 275 and *Implacable*'s designation letter 'N' on the tail.

Rebecca Greenwood Harding, head of technological objects at IWM Duxford, says, "Z2033 is one of the oldest examples of a Firefly in the world today, so we're delighted that visitors will be able to see her up close as a highlight of IWM's naval fighter collection. The Firefly was also one of the earliest aircraft acquisitions to the collection when IWM Duxford opened to visitors in the late 1970s, so it is very special to see her returning home for permanent display in our Air and Sea hangar."

Viscount restoration under way in Brazil



The Projeto Vickers Viscount group poses in front of its charge, the ex-BEA/VASP Viscount 701 PP-SRJ, at Araçariguama during July. VIA BRIAN BURRAGE

At Araçariguama, 31 miles west of the Brazilian city of São Paulo, volunteers from the Projeto Vickers Viscount group began restoration work on Vickers Viscount 701 PP-SRJ during July. Led by aviation engineer Prof Mario M. Silva and commercial pilot Enio Beal, part of the project's aim is to help train young people who want to enter the aviation industry.

This Viscount was originally built for British European Airways as G-AMOD and first flew on 17 June 1953 at Weybridge. During August 1962 it was acquired by Viação Aérea São Paulo (VASP), which operated it as PP-SRJ until it was withdrawn from service at São Paulo in February 1969. Five years later, VASP donated it for a children's playground at Piracicaba. The airframe was again moved by road to Araçariguama in 2006, seeing use as a children's cinema until 2014. Currently in a multi-coloured mural paint scheme, the Projeto Vickers Viscount team intends to refinish the aeroplane in its original VASP livery.

NEWS IN BRIEF

TREVOR BAILEY 1955-2023

Trevor Bailey, Great War Display Team member and owner-pilot of Auster T7 WE569/G-ASAJ, lost his life in the crash of a Spitfire Mk26 at Enstone, Oxfordshire, on 22 August. A stalwart of the UK historic aircraft scene, not least from his period managing the Air Atlantique Classic Flight, Trevor will be much missed by all who knew him. Condolences to his family. BEN DUNNELL

MiG-23 CRASHES IN MICHIGAN

Ex-Czech Air Force Mikoyan-Gurevich MiG-23UB serial 8107/N23UB crashed in Belleville, Michigan, on 13 August. The jet, owned by Dan Filer and based at East Texas Regional Airport in Gregg County, had been displaying in the Thunder over Michigan airshow at Willow Run Airport when it suffered a loss of engine power. Both crew members ejected safely, the aircraft coming down near an apartment complex, thankfully with no loss of life on the ground. BD

VIP An-2 ON SHOW AT RECHLIN



A 1965-built, former Soviet Air Force Antonov An-2T, c/n 1G-5929, recently went on display at the Luftfahrttechnisches Museum in Rechlin, north of Berlin. For almost 30 years, the biplane was used as a transport and command aircraft by the Group of Soviet Armed Forces in Germany from Großenhain near Dresden.

NF METEOR FOR WATTISHAM

On 25 August, the Boscombe Down Aircraft Collection announced that its Meteor NF11 WD686 will soon be moving to the Wattisham Station Heritage Museum in Suffolk. The aircraft had been on loan to the Defford Airfield Heritage Group in Worcestershire and on external display. Fortunately, undercover accommodation is available at Wattisham.

HRH VISITS BBMF

On 24 June, King Charles III visited the Battle of Britain Memorial Flight at RAF Coningsby to meet 18 Second World War Royal Air Force veterans and their modern-day counterparts currently serving as part of the BBMF. OC BBMF, Sqn Ldr Mark Sugden, said: "It was a real privilege to host His Majesty at the flight. For our veterans and all of those who are part of the BBMF team this was certainly a day to remember."



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Gannet T5 XT752 could make a spectacular addition to the Navy Wings fleet if former Gannet personnel come forward to get it back into flying condition at Woodville, Wisconsin. It was pictured at Oshkosh in 2014. STEVEN MARQUEZ/AIRTEAMIMAGES.COM

Navy Wings seeks Gannet veterans for return-to-flight project

On 4 August, Yeovilton-based Navy Wings put out an appeal to recruit two or three former Fairey Gannet mechanics who can assist in getting Gannet T5 XT752/N752XT — which was once G-APYO on the British register — back into flying condition at Woodville, Wisconsin, for a ferry flight to Spokane, Washington, where it will be subject to a full maintenance package.

The Navy Wings statement reads, "All going well, the intent in the near future is to repatriate it to the UK, where we hope to bring it under the care of Navy Wings. Successful candidates will ideally have direct experience of having worked with the Gannet, either as engineers or pilots. Help potentially available with travel and subsistence costs". Interested parties were invited to contact Tim Manna at tim@kennetaviation.com.

NEWARK 'SHACK' RESTORATION BEGINS

On 25 July, installation work started on a bespoke scaffolding system around the nose and forward fuselage of Avro Shackleton MR3 WR977 at the Newark Air Museum. This will allow teams of museum volunteers to work in safe conditions on this restoration effort, which will include sealing the main cockpit glazing, in-depth cleaning, conservation and the painting of this area of the aircraft.

For most of the work period, WR977 will continue to be one of the NAM exhibits to which cockpit access is possible. Visitor contributions to that end will go towards the ongoing fundraising campaign to cover the scaffolding hire costs and the necessary weekly safety inspections. It is anticipated that the Shackleton project will be completed in the first week of October.



Forty-six years after it first arrived at the Newark Air Museum by road, Shackleton MR3 WR977 is undergoing a programme of major restoration work. NAM



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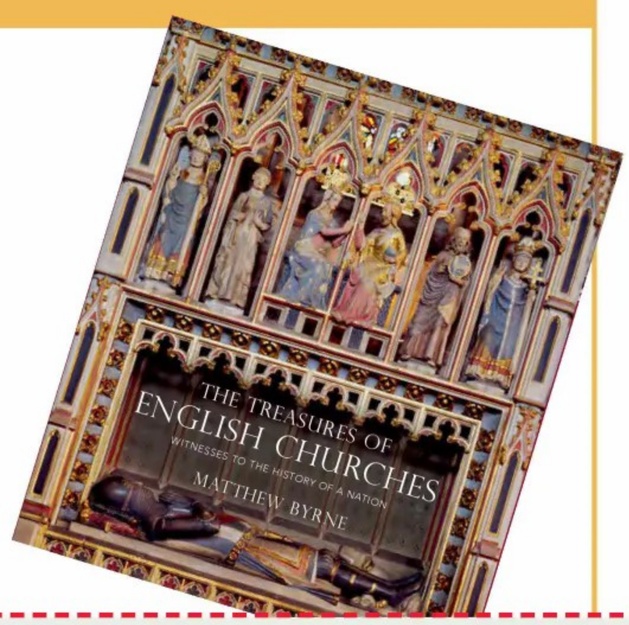
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Intrepid Concorde moved

On 9 August, BAC/Aérospatiale Concorde G-BOAD was moved from the Intrepid Air, Sea and Space Museum's dock in New York to undergo restoration work at the Brooklyn Navy Yard. It is due to have returned and reopen to the public in the spring of 2024. G-BOAD was lifted off Pier 86 and onto a huge barge, which took about two hours to reach the Brooklyn Navy Yard down the Hudson River.

The former British Airways airliner — which first flew on 25 August 1976 — has been at the museum since 2003. The August move is the first time it has left for restoration work, which will involve stripping it back to bare metal before a complete repaint into its original colours.

Susan Marenoff-Zausner, president of the Intrepid museum says, "Knowing how popular it is with our visitors, it's difficult to see Concorde depart even for a short time. But this necessary restoration will ultimately allow us to present this awe-inspiring technological marvel and continue to tell the stories behind it for the foreseeable future."



Concorde G-BOAD being lifted from its pier display site alongside the former USS *Intrepid* for the move along the Hudson River. ALAMY



Now on display at the Bournemouth Aviation Museum, Hunter T8C WT722 wears its 1970s FRADU markings. MICHAEL PHIPP



Its current dowdy appearance gives no clue as to the colourful history of Lynx HAS3(ICE) XZ238, which served on the Arctic survey and ice patrol ship HMS *Endurance*. MICHAEL PHIPP

RN CLASSICS FOR BOURNEMOUTH

The Bournemouth Aviation Museum at Hurn received two new exhibits with naval backgrounds during August: Hawker Hunter T8C WT722 arrived from the now defunct Cornwall Aviation Museum at Newquay on 2 August, with Westland Lynx HAS3(ICE) XZ238 pitching up four days later after the road trip from White Waltham, where it had been part of Shoot Aviation's collection of film props.

Presently the Lynx carries false serial ZF355 and a dark-blue paint wash, which will soon be removed by museum volunteers to reveal the original grey-and-red colours it wore while operating from the Antarctic survey and ice patrol vessel HMS *Endurance* during the 1990s and 2000s. The Hunter carries the scheme from its time serving with the Fleet Requirements and Air Direction Unit (FRADU) at Yeovilton in the 1970s and '80s. After a bit of a clean-up, WT722 will continue to be displayed in these markings. Hunters also served with the Bournemouth-based, Airwork-operated Fleet Requirements Unit (FRU) during the early 1970s.

Both aircraft have now been placed into the museum's newly expanded area, where they will be joined by Westland Wasp HAS1 XT431 and the nose of Hunter GA11 WV381, and in so doing form a Royal Navy display.





Christian Lamb in the cockpit of Miles Magister P6382, just after re-creating her 1943 aerial lift home after missing the bus; and with Shuttleworth pilot Richard Crockett in the rear cockpit, the 103-year-old former Wren enjoys her flight over the Bedfordshire countryside, 80 years after her previous Magister trip. DARREN HARBAR

WW2 Wren flies in Shuttleworth Magister

The 103-year-old former Wren Christian Lamb, one of the last surviving Women's Royal Naval Officers to have served for the entire war, relived a wartime flight at Old Warden on 6 August when she went up in the Shuttleworth Collection Miles Magister, P6382/G-AJRS. The occasion commemorated Christian's ride in a Magister during 1943, when a young Polish pilot offered her a lift back to her base.

Christian's memoir *Beyond the Sea* (Mardle Books, 2021) recalls the event: "By now there were occasional courses laid on for Wrens and I was sent to Bath to do one. What it was about remains a mystery, but I do remember that on the return journey I missed my train. How I came to do this I can't imagine, as one of my many failings is to be always frightfully early for everything. This trait I think must be hereditary because I remember my father describing how in his youth, his family went on a journey by train. Incredibly, the horse-drawn coach, complete with passengers and luggage, was made to do a dress rehearsal to the station the day before!

"I definitely didn't go as far as that, but having missed the train it was a despairing moment and I could not believe my luck when I was saved by a delightful Polish officer with whom I had been consorting at a party the night before. He astonished me by saying, 'Shall I take you back in the old crate?' 'What old crate?' I was nearly speechless when I realised he meant his aeroplane. I stammered out my rapturous acceptance!

"This episode may sound quite ordinary now but then it was quite the most daring episode in my life. My rescuer was, I suppose, an instructor because he had at his disposal a Magister. I had to sit on my parachute in the back and we set off in fine style looking out for and overtaking the train I had missed. My pilot tried to give me some good frights en route and make the trip extra-thrilling by dive-bombing cows or anything else that took his fancy. I had been hoping that he might loop the loop for an extra show-off, but perhaps it was just as well that he didn't, or I might have fallen out. Flying in an open plane, low down over the River Tamar and seeing the whole estuary and coast as on a map, was an experience I'd like to relive even today."

That wish came true prior to the Circus Airshow at Old Warden during the morning of 6 August. Christian thoroughly enjoyed the experience, with Shuttleworth pilot — and *Aeroplane* columnist — Richard Crockett at the controls, and commented that it was "a lot noisier" than she had remembered. She also said, "I am very grateful to all at the Shuttleworth Trust for giving me this wonderful experience. I will remember and relive these precious minutes in the sky for the rest of my life. It was such an exciting and thrilling experience."

Lamb worked on the D-Day landings and remembers often passing Winston Churchill on the stairs in the Cabinet War Rooms.

ALBATROS ON SHOW AT NEW POLISH ARMY MUSEUM

On 14 August, the new Polish Army Museum opened its doors at the Warsaw Citadel, in the north of Poland's capital city. One of the star exhibits is a reproduction Albatros D.III fighter, which wears the markings of the 7. Eskadra Lotnicza, better-known as the 'Kościuszko Squadron'. Formed in late 1919 by Merian C. Cooper, who had served as a DH-4 bomber pilot with the US Army Air Service during World War One and went on to co-direct and produce the 1933 film *King Kong*, the unit was made up from a group of more than a dozen American volunteers who stayed in Europe after the 1914-18 conflict to fight for the Second Polish Republic against the Soviet Union during the Polish-Bolshevik war of February 1919-March 1921.

Still on display outside the old Army Museum in central Warsaw are a large number of former Polish Air Force aircraft, including a Petlyakov Pe-2, Tupolev Tu-2, Ilyushin Il-2 and Il-10, and a Yak-9. These constitute the largest assembly of Second World War-era aeroplanes still displayed outdoors in Europe. Thankfully, the move of this priceless group of exhibits to the new museum for restoration will begin during the course of 2024.



The Albatros D.III, wearing the markings of the 'Kościuszko Squadron', is one of the highlights of the newly opened Polish Army Museum.



Dragon Rapide F-AZCA in the early summer of this year. The aircraft is being put together inside one of the newer hangars in the central area of the aerodrome at La Ferté-Alais.

FEED THE DRAGON

The Amicale Jean-Baptiste Salis is making excellent progress with its de Havilland Dragon Rapide restoration, but needs funding to see it through

WORDS AND PHOTOGRAPHY: BEN DUNNELL

Like many of its breed in preservation, DH89A Dragon Rapide F-AZCA was akin to part of the furniture. Go to La Ferté-Alais for its annual airshow, and the de Havilland twin, part of the Amicale Jean-Baptiste Salis fleet, would inevitably be one of the performers. That was until the late 2000s, when it ceased taking to the air. More recently, it disappeared entirely from public view. What had happened?

The answer was to be found in the AJBS workshops at La Ferté this spring, as the Rapide showed several details of an extensive restoration. Supported by France's main national heritage foundation, the Fondation du Patrimoine, the AJBS team is in the process of transforming what was previously a rather tired aeroplane into a fine airworthy specimen, ready to open another chapter in a highly varied flying career lasting more than 80 years. But there are still some hurdles which need to be overcome before that can happen.

> ***"The machine was allocated to the Air Transport Auxiliary"***

Built as a Dominie I for the RAF with constructor's number 6541, the aircraft rolled out of de Havilland's Hatfield plant by mid-1941. It received serial X7381 before being delivered to No 9 Maintenance Unit at Cosford on 14 July 1941. From that October until the following March, the machine was allocated to the Air Transport Auxiliary at White Waltham, presumably as a pilot ferry aircraft. A period of storage ensued, initially back at Cosford, then with the Dumfries-based No 18 MU.

In September 1942 the Dominie headed south again, to Yatesbury in Wiltshire. There

it joined the strength of No 2 Signals School, renamed No 2 Radio School at the start of 1943. Fulfilling one of the type's myriad wartime functions, X7381 trained countless radio operators before their conversion to operational multi-engined machines from then until soon after VE-Day. Returning to its manufacturer for major maintenance in late May 1945, one more military assignment followed — to the Aeroplane and Armament Experimental Establishment at Boscombe Down, beginning in November. The nature of its duties there is not recorded, nor their precise duration, but X7381 was decommissioned and stored at Kemble with No 5 MU in January 1950.

The aircraft was sold via tender into civilian hands, being registered G-ALZF on 24 March 1950. The Rapide went first to the Herts and Essex Aero Club at Broxbourne, and then, after just over four months, to the East Riding Flying Club at Bridlington. In August 1951 it was acquired by Frank Elliott, who kept it briefly at Croft. The register then records a sale a year later to France, where the machine has remained ever since.

Many Rapides were used as sport parachute jump platforms by associations in the UK, but France got in on the act first.



In the pretty Blue Way cigarette livery, applied — complete with starting number 71 on the nose — for 1981's Air Transat race from Paris to New York (well, Connecticut) and back. DENIS J. CALVERT



Prior to the start of restoration in 2021, the Rapide wore this approximate RAF scheme. Here it displays at 1988's La Ferté show. DENIS J. CALVERT









CLOCKWISE FROM TOP LEFT: The uncovered fuselage in May 2021, showing the need for various repairs. BERNARD CHARLES VIA AJBS **Control lines have gone back in, and the instrument panel is in the process of being fitted-out. The completed starboard upper wing shows evidence of the Royal Navy colour scheme in which F-AZCA will appear. The starboard Gipsy Queen engine is back on the aircraft, having been overhauled by the AJBS powerplant specialists.**

G-ALZF took up its new identity, F-BGON, on 24 September 1952. It had been purchased by a state-run entity, the Service de l'Aviation Légère et Sportive (Light and Sporting Aviation Service), which provided aero clubs and similar entities around the country with aircraft and instructors. This was the case with several DH89As for parachuting purposes, F-BGON taking up residence at Buc, near Versailles. Transferred to Gisy-les-Nobles, ownership passed in 1961 to the local Centre Inter Club Parachutisme. Subsequent periods were spent with equivalent organisations at La Ferté-Gaucher and Nantes.

It took just 2,500 francs for Jean-Pierre Lafille to buy F-BGON from the Nantes skydivers in 1973. Ferried to La Ferté-Alais, it appeared in a scene filmed there for the 1974 movie *Stavisky*, starring Jean-Paul Belmondo as the notorious inter-war financier Alexandre Stavisky.

> ***"Aluminium sheets made it more easily detectable by radar"***

Jean Salis acquired the Rapide either in 1976 or '77, and at the outset of the new decade it began to be prepared for a significant adventure. This was the one-off Air Transat air race from Paris to New York and back.

A fresh registration in the French historic aircraft category, F-AZCA, was taken up in April 1981, and on 6 June it set off from Le Bourget in the hands of Jean Salis and Pierre Dague. Sponsorship had been obtained from Blue Way, a new cigarette brand, and the Rapide sported its colours. To be officially classified in the results, entrants — of which 79 took the start — had to fly to Bridgeport, Connecticut, make a minimum 24-hour stop-over, and return to Paris no later than 14 June. Despite poor weather, icing conditions and stages in excess of 10 hours' flying time, F-AZCA performed superbly, ending up as a finisher and winning the race's concours d'elegance to boot. A magneto problem at Goose Bay on the return flight was the only technical problem of note. Not so bad for a then 40-year-old biplane.

By the late 1980s a repaint had put the aircraft into a spurious RAF camouflage scheme, while Jean Salis sold it to the Amicale Jean-Baptiste Salis in 1996. F-AZCA carried on flying, but its last La Ferté-Alais display occurred in 2006, subsequent showings being limited to static-

only. When the AJBS decided to embark upon a restoration, it turned to the Fondation du Patrimoine in support. This private, non-profit-making body, whose name translates as Heritage Foundation, promotes and assists fundraising for heritage projects on a local basis. The Rapide was deemed worthy of support within the Essonne region, and a campaign for donations towards its return to flight began in 2017.

With a first tranche of funding towards an estimated total cost of €300,000 in place, preparatory work began during May 2021, in the form of an extensive technical investigation. The fuselage was uncovered, the wings and tail removed, and a structural analysis carried out. Its findings showed that some ribs would need to be replaced, as well as certain areas of the plywood covering, but the overall result was satisfactory. An interesting discovery was the presence of aluminium sheets on the rear fuselage sides, fitted in 1980-81 to make the aeroplane more easily detectable by radar during the Air Transat race.

The flight controls were taken out for checks and a certain amount of rectification. Likewise, the whole undercarriage was removed and dismantled in order to be comprehensively overhauled, and the DH Gipsy Queen engines and their propellers dismounted prior to inspection and overhaul. All of this is taking place in the AJBS's own workshops, the team being led by Jean-Pierre Toublanc, supported by Guy Legallet. Technical assistance is being provided from the UK, thanks to the expertise of de Havilland Support and the de Havilland Moth Club.

Progress by the spring of 2022 had seen areas of damage repaired, the empennages being re-covered, and the start of that process on the fuselage. In July 2023, only the underside of the fuselage awaited re-covering, and initial colour scheme application had begun. F-AZCA stands again on its wheels, with the starboard Gipsy Queen attached; the port engine is close to being completed, but requires further funds. The lower wings have been refitted, and the starboard upper wing is sitting ready, fully finished. The port upper wing is still being worked on.

Major tasks to follow include fitting-out of the cockpit — into which some instruments have been installed — and the cabin, which will be configured with six or seven seats. The chosen livery will please British eyes: a Royal Navy Dominie, serial HG709, as operated by the RNAS Culdrose (HMS *Seahawk*) Station Flight in 1960-61. That aeroplane did not survive, having suffered a landing mishap at Roborough and been struck off charge, prior to being burned on a Portsmouth Corporation rubbish dump during December 1962. The scheme is an eyecatching one, featuring as it does a dayglo nose leading into a fuselage flash, matching details on the cowlings, dayglo outer wing leading edges and rudder. No Rapide has flown in Royal Navy colours since G-AGTM was last operated by the Russavia Collection in 1987.

When it returns to the flightline, F-AZCA will become one of four DH89As airworthy in mainland Europe. There are two in Germany, one each with the Koch collection and Karl Grimminger's fleet, while another is operated by the Cuatro Vientos-based Fundación Infante de Orleans in Spain. This is an aircraft type with a great deal of history not just in its homeland, but across the world. Little wonder, therefore, that the Rapide has become a priority for the AJBS. The day another piece of Britain regains its place in the La Ferté-Alais skies is eagerly awaited.

With thanks to Jean Briez, Henri Suzeau, Cyrille Valente and Jean-Marc Viard.

SUPPORT THE RAPIDE

To donate towards the Rapide restoration project, visit the Fondation du Patrimoine website at:
www.fondation-patrimoine.org/les-projets/avion-dragon-rapide



Re-covering of the port upper wing was nearly done at the time of our visit.



Engine cowlings ready to be refitted.



An artwork published in our sister magazine *FlyPast* is providing references for the chosen livery, that of Dominie HG709.



DENIS J. CALVERT

FlightLine

Recollections and reflections — a seasoned reporter's view of aviation history

Last year, I wrote of Britain's 'V-bombers', which provided Britain's strategic nuclear deterrent — Britain's *independent* strategic nuclear deterrent — through the late 1950s and the 1960s. By the end of the 1950s came the realisation that advances in Soviet surface-to-air missile technology had made the 'V-bomber' force's ability to deliver a free-fall nuclear weapon over heavily defended territory ever more questionable. The Blue Steel stand-off weapon, which would enter service in late 1962, promised a temporary reprieve, but its 100-mile range was insufficient to give the launch aircraft a realistic prospect of penetrating enemy air defences.

Enter the GAM-87A Skybolt, a true air-launched ballistic missile with a 1,000-mile range. Skybolt's origins were in a joint Anglo-American requirement for a weapon to be carried primarily by the USAF's B-52s, but also by the RAF's 'V-bombers', to follow on from the Mach 1 Blue Steel. The project was firmed up in 1959, with Douglas Aircraft as the main contractor. To the RAF, Skybolt had the attraction of prolonging the life of the 'V-bombers' as the UK's strategic nuclear deterrent and building on the investment that had been made in Bomber Command. Prime Minister Macmillan met President Eisenhower at Camp David in March 1960. This led to an agreement that the RAF would



Vulcan XH537 with a pair of dummy Skybolts for test purposes. BAE SYSTEMS

be offered Skybolt, although the project was at a very early stage and the memorandum stated that this was "necessarily dependent on the successful and timely completion of its development program."

Britain managed to negotiate very favourable terms (unlike with Brexit) to procure the weapon. The full research and development costs would be borne by the US, with the UK responsible only for the cost of the modifications to fit whatever RAF aircraft would carry it and of developing a suitable British nuclear warhead. An initial RAF order for 100 Skybolts was placed, with the intention that each 'V-bomber' would carry two missiles. The Vulcan B2 could comfortably fit one missile under each wing, but the Victor B2 had, despite Sir Frederick Handley Page's protestations, ground clearance problems, and was soon ruled out as a carrier.

> ***"The US offered Britain the whole Skybolt programme"***

Macmillan was riding the crest of a wave. He had got Britain aboard a US programme that was well-funded and promised a bright future. With the improved Blue Steel Mk2 already abandoned and the Blue Streak IRBM about to be, Bomber Command had few alternatives and its planning increasingly revolved around Skybolt. A British trials team was set up at Eglin AFB, Florida and two Vulcan B2s were allocated to the development programme. Soon, XH537 was flying with two dummy rounds in November 1961.

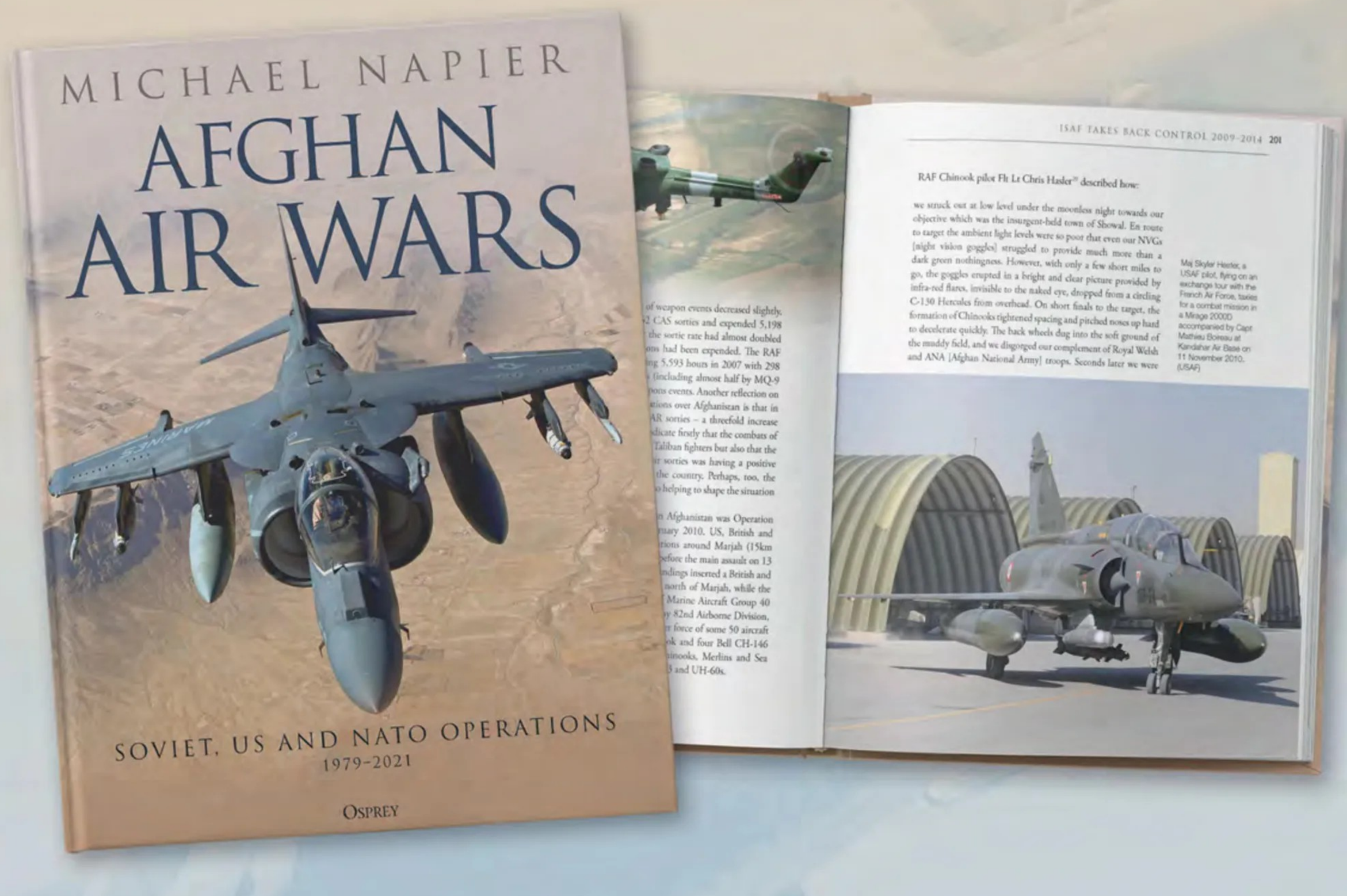
Skybolt development was well under way when, in December 1961, the US Secretary of Defense informed the UK government there was uncertainty as to whether its technical challenges could be met. The first live drop test, conducted from a B-52 on 19 April 1962, failed, as did the following three launches. With R&D costs having doubled, by late 1962 the US had decided on termination. As a gesture of goodwill, it offered the UK the whole Skybolt programme, with ongoing costs to be agreed. This, though, was an offer Britain examined and rejected, which suddenly left Whitehall's defence planners with the problem of finding ways in which to keep the 'V-force' viable into the late 1960s.

Low-level Blue Steel and lay-down bombs would be the short-term outcome, but the RAF's custody of the UK's strategic nuclear deterrent was coming to an end. The future, confirmed by the Nassau Agreement of 21 December 1962, was a fleet of Polaris-armed nuclear submarines, and with this decision the Royal Navy would go on to reclaim its position as Britain's 'senior service'.

MICHAEL NAPIER

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From the Cockpit



RICHARD CROCKETT

Join the Shuttleworth Collection's latest pilot on his vintage flying journey

Apart from the English Electric Wren, my Shuttleworth journey thus far has mostly comprised aircraft which can be seen at other places. The Southern Martlet, however, is unique. Not only is Shuttleworth the sole location in the world where you can watch one fly, but it is also the only place you can see one full-stop, thanks to it being the last surviving example.

Like many aircraft in the collection, the Martlet is as British as it comes. G-AAYX is a single-seat, open-cockpit sporting biplane built by the Southern Aircraft Company in 1930, and loosely based on the early '20s Avro Baby. The designer was none other than F. G. Miles, and the collection's example was his personal mount, which he kept at the Miles company's Woodley airfield home.

Only six Martlets were built, 'YX being the third of them. It is powered by a five-cylinder Armstrong Siddeley Genet Major radial, which generates 105hp. This engine, too, is unique. Just one other airworthy Genet exists, although this is the later 1A model, fitted to Biggin Hill-based Civilian Coupe G-ABNT.

So, how does one approach the sole surviving specimen of an aircraft? As you might imagine, the collection holds a substantial library of detailed pilots' notes. In recent years these have been digitised and rewritten into a standardised, homogenous format for all the aircraft. While thorough examination of the notes and other associated documentation is essential, there is absolutely no substitute for speaking with another pilot who has flown the type themselves, so additional important knowledge can be passed on.



Clear prop! The Martlet is started, with Richard aboard. PHIL CHAPLIN

> ***"It would probably perform aerobatics beautifully"***

Ground study is followed by a lengthy sit in the cockpit, which enables you to get a feeling of the layout and memorise where the vital instruments and controls are. Clambering into the cockpit itself requires some effort, as there is no door to aid your entry. Therefore, it is necessary to swing your right leg over the cockpit side to a height generally only achievable by professional gymnasts. Assuming you're successful and haven't put your flying boot through the fuselage fabric, it is possible to stand on the seat and climb in. Thankfully my wife Francesca, who often volunteers as part of the collection's groundcrew, was on hand to assist with my straps and pass me my flying helmet once I was installed.

The cockpit is somewhat sparse, with only a smattering of instruments. The flying controls are made up of a stick and rudder pedals; there is no trimmer, flaps, slats or brakes. The tailskid is also fixed, meaning directional control on the ground is only achievable when there is sufficient airflow over the rudder. The engine is started in the traditional way by hand-swinging, and the little Genet Major makes quite a delightful sound. Taxiing is achieved thanks to the help of wing-walkers to aid steering and the take-off is surprisingly spritely.

In the air, although aerobatics are no longer permitted to preserve both the airframe and engine, you instantly gain a sense that the aircraft would probably perform them beautifully. Slow flight and stalling are benign and, in many ways, quite enjoyable as with the throttle closed you can hear the whistling of the flying wires, which is wonderful. Throughout normal flight the stick forces are high, as all Shuttleworth aircraft which do not have adjustable trimmers are rigged so the aeroplane is 'in trim' at approach speed.

The approach itself is flown with ease, although you must take care to ensure your landing is conducted as much into wind as possible. You can either three-point or 'wheel' the aircraft on. The only difficulty comes just after landing, in that it can be a challenge to keep the aircraft straight due to the fixed tailskid. It may be necessary to apply liberal bursts of power to maintain directional stability.

The Martlet is an utter joy to fly. Flying a unique aircraft is a true honour, and I cannot wait to take to the skies in it once again.

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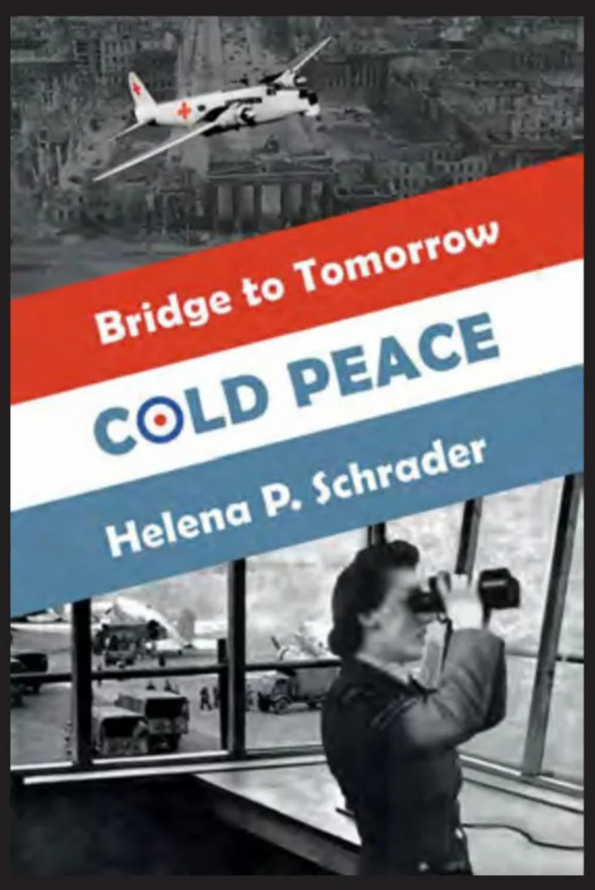
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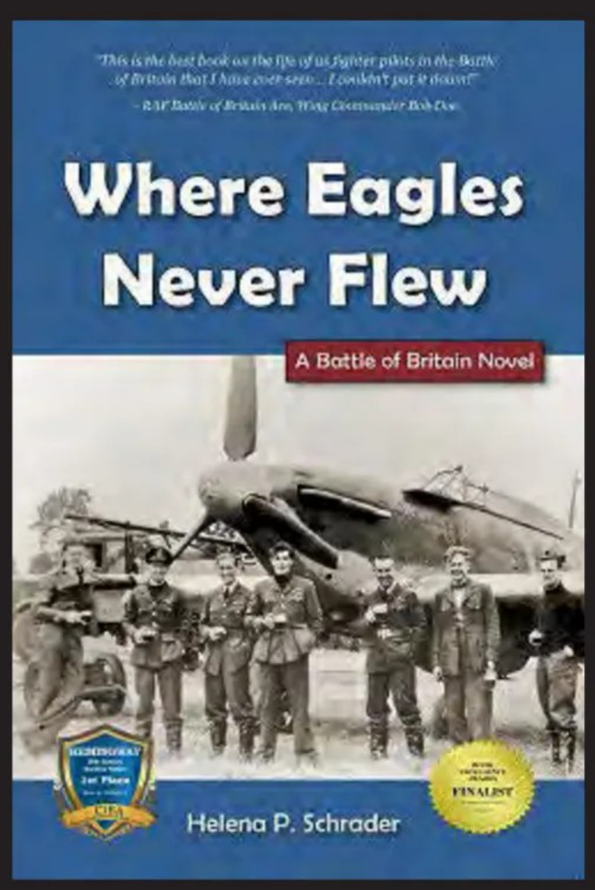


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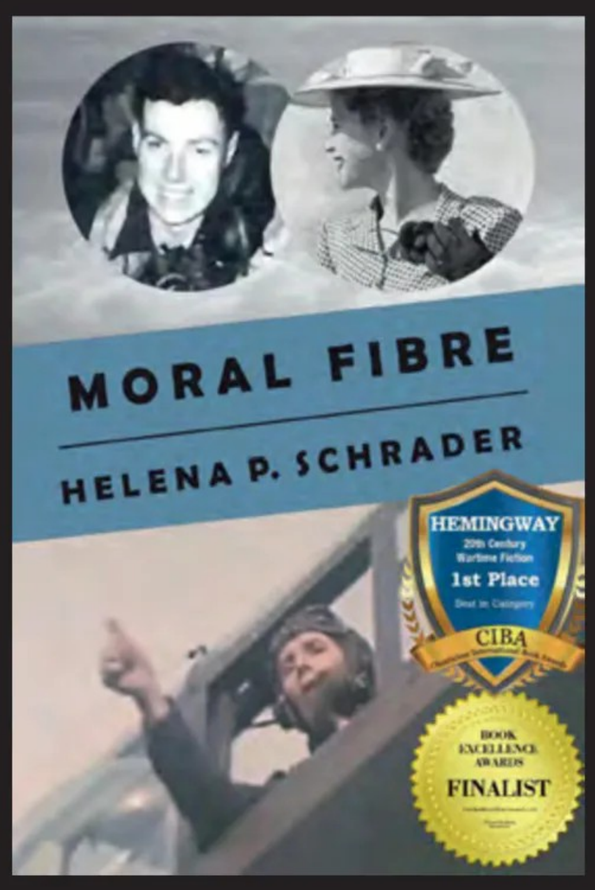
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LETTER of the MONTH



We couldn't resist publishing this again — Sunderland G-BJHS and its memorable Gatwick flypast. VIA ADRIENNE WRIGHT

A smile came upon my face as I read about Short Sunderland V G-BJHS and the flight along the Gatwick runway on 31 July 1989 (*Aeroplane* August 2023), as I was working for Gatwick Handling Services, at the time part of Dan-Air Services and Delta.

My role in ground service, seeing in and pushing back, had been suspended that day as I took out Gatwick Handling's Land Rover to be run around for pushback vehicle crews, a role normally done by ground control deployment supervisors. This left me more freedom to watch activities going on. I had to see in a Hughes helicopter, having just been trained to ground-direct it with batons — in itself a strange experience. Having completed that, I climbed into the 'Landie' to hear Gatwick Handling controller Ed Winchester repeatedly calling me to respond, so I dutifully replied. Ed always sounded as if he had a mouth full of marbles as he rounded out words, but was truly aircraft-mad. "Stewart, get your backside over to the south terminal with a One-Eleven push-bar. Should be one on south park next to you. Move, boy, as they're impatient to go."

With a speed limit of 20mph, I hitched the bar and drove at 25mph, keeping an eye out for BAA staff who could stop me and withdraw my driving permit. I stood as wing guard as the Dan-Air flight was pushed off-stand, started and departed, before hitching the bar again, ready to return to the office parking area. Then I heard on the tower inbound service, "Gatwick tower, this is Short Sunderland 'Hotel Sierra', over". The tower replied, "Hotel Sierra, go ahead". "Gatwick tower, Sunderland 'HS is inbound to your traffic control area and would like to request a low flypast over Gatwick Airport". The reply from the tower was one of excitement and total enthusiasm with a big, fat yes. The instruction was to fly down runway 26 on a low pass and to call once in the circuit, with the airport instructions also given to join.

On Gatwick Handling's radio frequency, I called Ed Winchester, asking if he had heard the call for the Sunderland to enter the circuit. "Stewart, don't pull my pud. Even you know a Sunderland has no undercart, so don't take the pee". "OK, Ed. 'Hotel Sierra' is on her way into circuit in Ryanair colours" — the initial call-up was on a Ryanair callsign — "and she will be doing a flight over the airfield". Ed replied by questioning my parentage and advised I should not use the radio without reason. I advised he turn up the tower frequency, as the lovely flying boat was on its way in.

I then heard the aircraft had joined and the tower advising inbound passenger flights if they would accept a delay for a Sunderland flypast. All must have agreed, and I sat at 26 by the blast barrier as 'HS came in. The sound of those four radials was music to my ears as she came over the edge of the airfield, and flew very, very low down the whole length of the Gatwick runway, slow and steady. For me, I can only say the emotions were a swelling chest and almost wanting to cry with pleasure. 'HS then turned sharply to starboard, low around the edge of the airport, giving a superb view as landings resumed. But my eyes stayed on her as she left.

The tower controller was brilliant in his response, stating that all who could had stood and watched in the tower. He thanked the crew for the low display and the pleasure brought to everyone who knew what they were seeing.

As for Mr Winchester, I got a message: "Stewart, apologies. You lucky b******. I hope you took some photos! Get back to the office and come to the control desk". Ed was a lovely but gruff guy. He went on to tell me I'd seen something I would never see again, and bemoaned the fact that since he was a boy he had seen many types at the airport, "but never a bloody Sunderland flying in". He released me to go and get my lunch, and life resumed its normal fun and games.

Stewart Lindfield

I thoroughly enjoyed the article about Sidney Cotton and the Lockheed 12As (*Aeroplane* August 2023). The name Sidney Cotton was familiar to me, as my father, Harold Hendrickson, may have worked on G-AFTL while it was undergoing repairs with Lockheed Aircraft at Burbank, California. As a young lad growing up in an aviation family during the 1950s, my father would often regale me with stories of his pre-World War Two and wartime adventures. After a few years as an apprentice with Floyd 'Speed' Nolta, circa 1938-40, my parents migrated to southern California to participate in the huge expansion of the aviation industry. Because of his credentials — limited commercial pilot, and airframe and engine mechanic — he was quickly accepted by Lockheed. Initially assigned to the Hudson production line, he was responsible for installing the Wright R-1820 Cyclone engines on new-production aircraft.

At some time prior to December 1941, he was pulled from the production department and transferred to the civilian aircraft department. Lockheed

had very few employees who held CAA-certified A&E mechanics' licences. One of his first projects was to assist in the repair of a Lockheed 12. My father would always describe it as, "owned by a wealthy Englishman named Sir Sidney Cotton". I am sure he was unaware of the camera ports, otherwise he would have mentioned that curious fact. After reading the article, I am now aware that Cotton was neither knighted, nor the aircraft's owner. At any rate, how enjoyable to read about what had been 'old family lore'. After Pearl Harbor, my father enlisted in the US Army Air Forces, but that is another story.
Gary Hendrickson

Denis Calvert made mention in the August issue of the fact that the SR53, prone-pilot Meteor and Hunting H126 were outside at the recent RAF Cosford Air Show. I visited the museum there on 27 July and was somewhat surprised and concerned to see that these three historic aircraft were still outdoors, together with their information boards, behind some orange plastic netting. From enquiries made with several of the museum's staff, it appears they will be staying on outside display, which presumably accounts for the black sheeting over the cockpit canopy of the SR53 which Denis mentioned.

It seems to me to be quite wrong to have these unique testbeds exposed to the weather, when there are a number of World War Two Luftwaffe airframes on indoor display that maybe should not be there if space is limited. If the museum has insufficient indoor space, then I believe it would be preferable to have these three aeroplanes placed in covered storage until indoor display space can be found for them.
Paul Baker

This is certainly an issue worthy of concern. While I would not wish to see the museum's Luftwaffe airframes rendered homeless, the fact of three unique research airframes being left outdoors for months ought not to be acceptable. We will monitor developments in future issues, and welcome comment from the RAF Museum — Ed.

I've been to the top of the world lately in aid of my Royal Canadian Air Force centennial book project. What did I find at Canadian Forces Station Alert, Nunavuk? A recent copy of *Aeroplane*. You can see it's a bit basic nature-wise at Alert; very little grows during the short summer at 82° north latitude. This is the most northerly permanent habitation on planet earth, so *Aeroplane* brings a bit of comfort to those posted here, usually for six months.

This summer about 100 personnel are busy at Alert with a wide range of activities. Signals intelligence remains the station's chief activity. There is but one flight a week — a C-130J sustainment flight from CFB Trenton. This overnights each way at Thule, which added to the fascination of the trip for me. Flight time each way is eight hours, so it's quite the grind getting in and out. Long 'Herc' flights are not my favourites! My escort grabbed this quick snap of me (above).
Larry Milberry



Larry Milberry, Canadian Forces Station Alert, and a little light reading. CAPT HRAYR KARAGEOZIAN

I enjoyed your article on Spitfire G-ALGT (*Aeroplane* July 2023) and can add a little more to its history. When it returned to Hucknall, Cliff Rogers as chief test pilot decided he wanted to retain the wingtips and a camouflage colour scheme. I was then a very junior weight engineer in the stress office. Among my responsibilities were the weight and balance calculations for Hucknall's flight test and communications aircraft. The port wingtip was found to be in poor condition and was sent away for a complete overhaul, while the starboard was reused in original condition.

It was understood that No 350 (Belgian) Squadron's aircraft were in bare metal at the time RM689 flew with the unit, so a generic scheme for a Spitfire XIV was chosen. As there was good photographic coverage of RM619/AP-D of No 130 Squadron in the Harleyford Spitfire publication, that aircraft was chosen. That was the extent of the research undertaken, but Cliff Rogers was happy flying a camouflaged MkXIV with a classic Spitfire wing shape.
David Lee



The SR53 and prone-pilot Meteor outdoors at Cosford as far back as May. Not good. KEY/BEN DUNNELL

The editor reserves the right to edit all letters. Please include your full name and address in correspondence

Q&A

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Are you seeking the answer to a thorny aviation question, or trying to trace an old aviation friend? Our 'questions and answers' page might help

THIS MONTH'S QUESTIONS



Name this 1913 monoplane

Q Malcolm Adams recently unearthed a photo album from one of his past relatives, and came across a postcard of a crashed monoplane at Lark Hill. A note on the reverse said the pilot, Lt Alexander William Hewetson, was attached to No 66 Battery, Royal Field Artillery, and was killed taking off on a flight to gain his licence. Although a memorial to Lt Hewetson was erected close to where he died, what is not recorded is the aircraft type he was flying. Can anyone identify the machine from the skeletal remains in the photograph? Malcolm is also curious to know whether Hewetson is a distant relative.

SAS flights to 1950s Berlin

Q In the early 1950s, Scandinavian Airlines System had an agreement with the UK allowing the airline to fly domestic passenger services within the British-controlled zone of Germany. The agreement involved flights between Hamburg, Bremen, Düsseldorf, Frankfurt and Stuttgart using DC-3s. Lars-Erik Ingerlo would like to know which UK authority signed the agreement and did any other airline such as KLM, Sabena or Swissair have similar arrangements?

Dams codewords

Q Regarding the RAF's dams raid, Rod Sanders e-mailed to say that while the codewords for the breaching of the Möhne and Eder dams are well-known, those relating to the planned attack on the Sorpe and the other three subsidiary targets are noticeable by their absence. Does anybody know them?

Morecambe mystery

Q On behalf of his postcard-collecting wife, Martin Duff forwarded this picture of an aircraft conducting five-shilling joyrides near the west end of Morecambe beach, Lancashire. Martin would like to know the aircraft type and suggests the date was around the 1920s. The print is titled 'The Blue Bird at Morecambe.'



THIS MONTH'S ANSWERS



Another view of the B-17 and F-111s flypast.

Fortress and F-111s – but when?

Q In August's magazine, Steve Baber sought the date and details of an event involving a flypast of B-17G *Sally B* and some F-111s, which took place at Thorpe Abbotts in the 1980s.

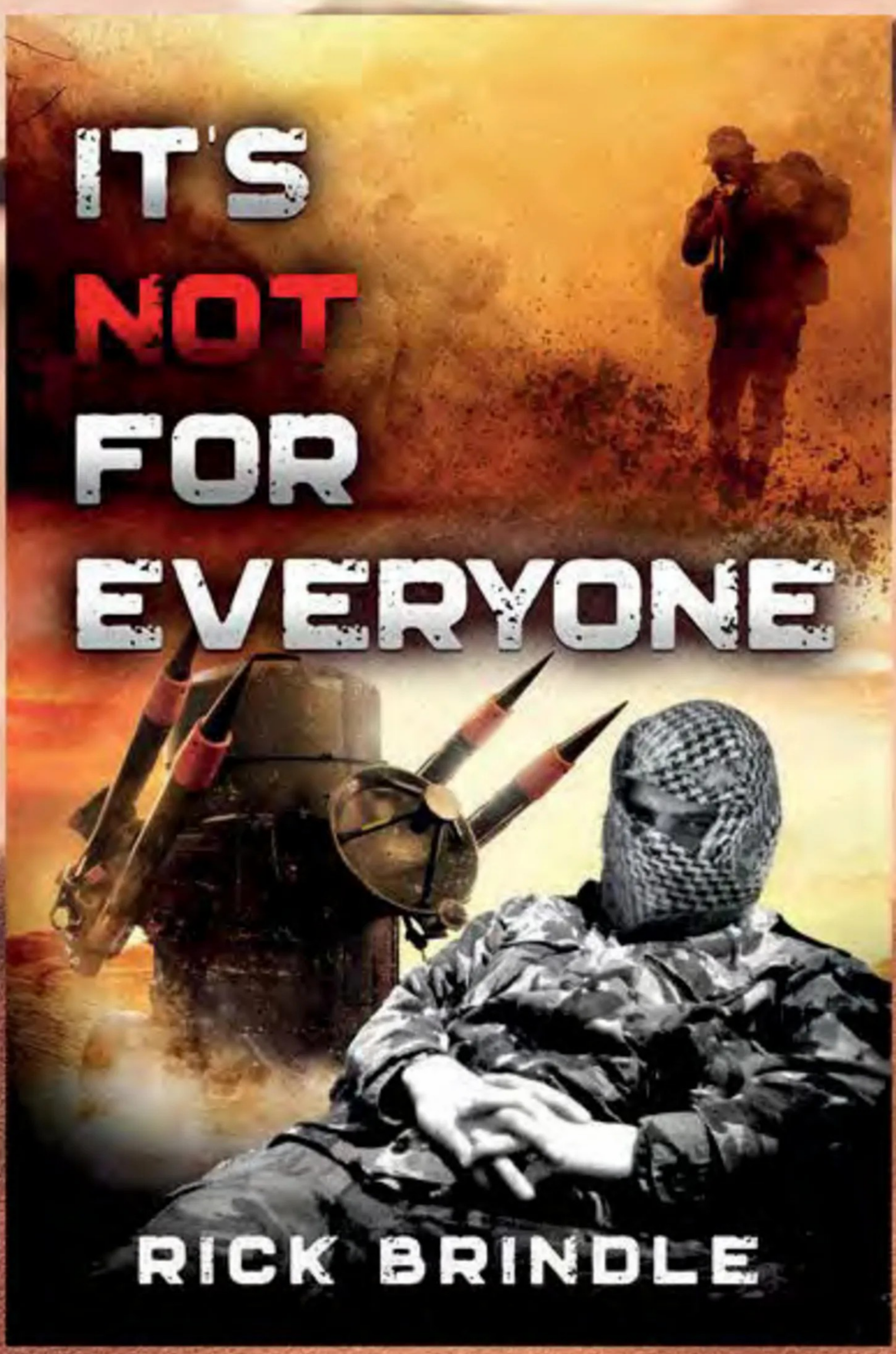
A Malcolm Finnis, a member and retired trustee of the 100th Bomb Group Museum, provides the answer as he was there — the date was Sunday 14 September 1986, when the group held its weekend reunion. More than 80 wartime veterans took part, plus families and friends, together with some 20 visitors from France, including members of the resistance. Robert Rosenthal, 100th BG veteran and the most decorated man in the 8th Air Force, opened the Varian Centre at the memorial museum on the airfield. The first flypast involved a single A-10A Thunderbolt II from the 81st Tactical Fighter Wing at Bentwaters, followed by the two F-111s with *Sally B*. Malcolm believes the F-111s came from the 48th TFW at Lakenheath.

Spitfire graveyard

Q Boyhood days in a scrapyard recalled by Martin Wyness in the July issue prompted him to ask if any readers remembered the location in Lancaster, and whether any of the three Spitfire fuselages he climbed in survived.

A Graham Skillen suggests Carlisle in the early 1960s might be a more likely location. Two Seafire 46s and a Blackburn Firebrand found in that area fit Martin's description of the remains.

A true story about the RAF Regiment's dark underside



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KEY Publishing

HUMAN ENDEAVOUR

For the crew of the third Vickers Viscount, named *Endeavour*, the long-distance air race from London to Christchurch 70 years ago took them — and their aircraft — into new territory **WORDS:** JOHN CHADWICK

It was the world's longest air race and tested the boundaries of aeronautical engineering. The 1953 London to Christchurch air race, part of the New Zealand city's centenary celebrations, aimed to demonstrate how distance need no longer be a barrier to international tourism. With the dawn of the jet age and the increasing volume of global air traffic, it was becoming less and less practical to organise an event of this kind, while some of the novelty of the pre-war era had worn off. Nevertheless, many important lessons were learned, some of great value in laying the foundations for future long-haul flights.

My father had moved from being a flying navigator with the British Overseas Airways Corporation to the position of flight services manager for British European Airways. His mount for the contest was the third prototype Vickers Viscount, a Series 700 given the name RMA *Endeavour* after Captain Cook's ship, with the registration G-AMAV. It had first flown in August 1950. Development of the Viscount was a joint venture between Vickers and BEA, and this example was on loan from the Ministry of Supply. It was painted in full BEA livery with race number 23 on the fin and a banner on the nose proclaiming 'London-New Zealand Air Race'.

The carrier began planning this adventurous undertaking, which was also to celebrate the coronation of Queen Elizabeth II, in August 1953. Flight services was given the task, and Dad was to be the navigator. It nearly didn't happen. Originally, BEA proposed to conduct the flight as a commercial operation carrying about 40 passengers and making 12 stops. However, once the handicap formula was released this proposal was seen to be unrealistic. Then, when difficulties arose in releasing a production Viscount from service, BEA abandoned its entry.

Following top-level discussions between the British and New Zealand governments, it was decided an official airline entry was most desirable, and the Ministry of Supply arranged to make G-AMAV available. Most of the cost was



Viscount G-AMAV taxiing to a stop at Harewood Airport in Christchurch, having become the first aircraft from the race's transport section to arrive. RNZAF

absorbed by the government with contributions from BEA, Vickers and Rolls-Royce, maker of the Viscount's Dart turboprop engines.

The aeroplane was to operate at an all-up weight of just over 27,215kg (60,000lb), and for the purposes of the handicap it would carry a 2,270-2,720kg (5-6,000lb) load. Rolls-Royce provided an increase in take-off power of some 10 per cent from the four Darts, with climb and cruise power outputs remaining the same.

One of the major modifications was the installation of four Marston Excelsior bag tanks of 5,910 litres (1,300 gallons), in interconnected pairs, in the fuselage. As it was a pressurised fuselage, this was a technical achievement of some note at the time, involving the pressurisation of the tanks. The bags were refuelled through oval panels fitted in place of windows on each side of the fuselage, while mattresses for the crew to rest on were laid on top of the rear tanks.

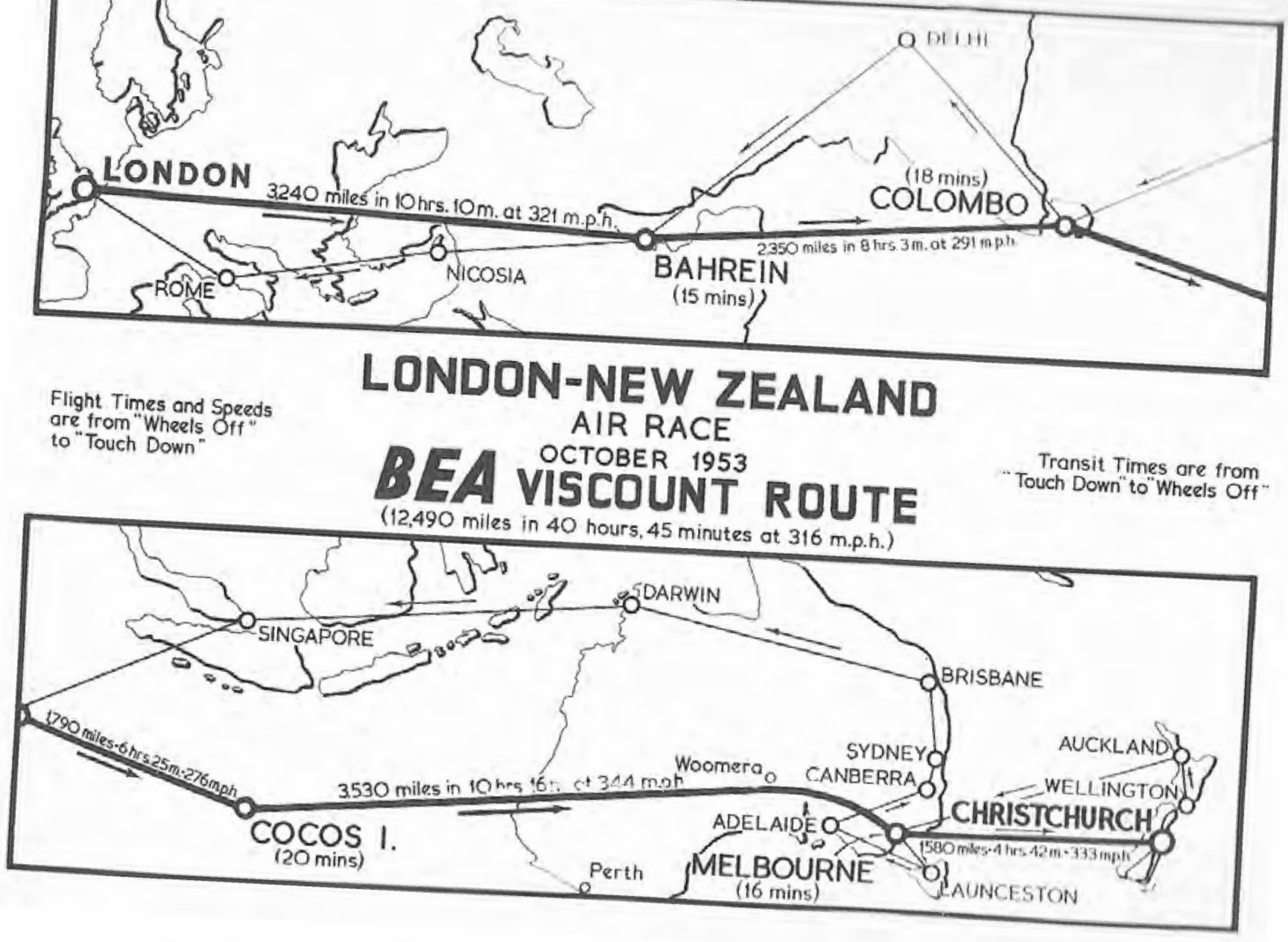
Since the Viscount was not designed for long-distance operations, weight was of the upmost importance. Every single item of equipment had been subject to intense scrutiny to ensure nothing non-essential was carried. Of course, emergency dinghies and signalling gear were provided, as were hard rations and survival kits for the desert and the jungle. The crew had undergone medical tests and hardened themselves by physical training. Proving flights at full load determined speed, fuel consumption, take-off distance and rate of climb. Several possible routes were plotted to accommodate variations in weather.

Meetings took place almost daily between people from the various BEA departments and specialists from Vickers-Armstrongs and Rolls-Royce. Refuelling and maintenance crews attended dedicated courses at London Airport and were despatched to take charge at all likely stops along the route, BEA having made rigorous arrangements for a standard 'turn-round' drill.

> ***"The weight of the Viscount was of the utmost importance"***

It was accepted that much would depend on weather and prevailing winds. Fuel reserves to reach alternate airfields in the event of bad visibility had to be considered. Many of the major decisions on refuelling stops needed to be taken in the air during the race itself. The aim was to obtain all flight plan data for each successive stage by radio in advance. Flight plans for the next sector could then be prepared, saving briefing time on the ground.

From 16 August-8 September Capt W. (Bill) Baillie, who was to be the chief pilot, carried out surveys of possible airfields to be used en route. He was joined by traffic manager Ian Scott-Hill and by Bill Boyd, an aviation engineer with Anglo-



BELOW LEFT TO RIGHT: Cockpit checks being carried out by Peter Masefield (left) and 'Chad' Chadwick, the author's father.
JOHN CHADWICK COLLECTION

A BEA briefing, with (left to right) pilot in command Capt Bill Baillie, team manager Peter Masefield, pilot Capt A. S. Johnson, chief radio officer Ian Dalgliesh with his back to the camera, navigation officer 'Chad' Chadwick, pilot Capt S. E. J. Jones and radio officer Eric Bristow.
JOHN CHADWICK COLLECTION







Mountaineer Sir Edmund Hillary, with his wife Lady Hillary, hands over to Peter Masefield a film of the conquest of Everest which was taken to New Zealand by the Viscount. ALAMY

Iranian Oil, who was an expert in the specific techniques evolved to refuel *Endeavour* in the minimum possible time. These surveys included on-site airfield inspections covering such technicalities as navigation aids and refuelling facilities. Also important were the customs, health, immigration and diplomatic aspects of each stop.

At 16.30hrs local time on 8 October 1953, the Duke of Gloucester fired a gun at London Airport to start what was billed as 'the last great air race.' The first aircraft in the transport section to embark on the 12,365-mile (19,900km) journey was KLM's Douglas DC-6A PH-TGA at 16.30, followed five minutes later by Royal New Zealand Air Force Handley Page Hastings NZ5804. The Hastings was the only aircraft that failed to finish, withdrawing in Ceylon (now Sri Lanka) with a failed engine and damaged flaps.

The Viscount set off at 16.40, flown by a BEA crew under Capt Bill Baillie and managed by Peter (later Sir Peter) Masefield, the airline's chief executive. The others on board were radio officer Eric Bristow, navigator 'Chad' Chadwick, BBC reporter Raymond Baxter, pilots Capt S. E. Jones and Capt A. S. Johnson, chief radio officer Ian Dalgliesh, flight engineers Ernest Walker, Roland Shaw from Vickers-Armstrongs and Stanley Jones of Rolls-Royce, and Parliamentary Secretary to the Minister for Civil Aviation John Profumo, of subsequent infamy, who acted as chef and steward. At the 25th anniversary lunch for the event 'Chad' mentioned how Profumo had done a great job, working "damned hard."

My father's brief notes of the interior layout describe the Viscount being stripped-out and seats provided for all the spare crew members across the back. "Four large fuel tanks", he said, were "fitted in fuselage with plywood tops on them". Fuel was pumped from the on-board tanks as the wing tanks emptied. "My seat in rough centre of what should have been passenger cabin with hinged table across aisle. Used plywood flat tops to store spare charts, astro tables, etc. On the whole, the crew, when moving from rest positions in rear to cockpit, jumped up on fuel tanks and walked around me. Even Profumo with trays of drinks did that."

The navigator's position he described as "Excellent", adding that the periscopic sextant was "immediately above my head with, as noted before, lots of space for spare charts/equipment all round me". It may not sound ideal, but he had mastered his craft in a small space navigating Lancasters over Germany for many more than the average number of sorties. There he sat behind the pilot in a curtained-off compartment, lit by one simple Anglepoise lamp. He would be constantly working, plotting the course of the aircraft, and adjusting if poor weather or enemy action called for a change of plans. All good training for this air race. 'Chad', as my father was known, had his work cut out and was hard at it for most of the flight. As Masefield noted about the crew's routine, "Four pilots and two radio officers take two-hour watches. Navigator fully employed."

Covering 3,240 miles in 10 hours 10 minutes and averaging 321mph, the first leg was to Bahrain, where there was a 15-minute refuelling stop. Then came a further 2,350 miles to Colombo, completed in eight hours three minutes and 291mph. Eighteen minutes were spent on the ground. Peter Masefield wrote from the Ceylonese capital on the "magnificent performance of aircraft and engines which are giving us a very comfortable ride". He added, "Meals being regulated by tummy time as times of day now utterly confused."

A six-hour 25-minute sector, averaging 276mph for 1,790 miles, saw the Viscount land in the Cocos Islands in the Indian Ocean. When they were about one hour out, Raymond Baxter reported, "We have had to fly through a quite severe inter-tropical front, which meant very rough air and very difficult conditions for Capt Baillie who gave 'Chad' a hand with the navigation at this stage. They were trying for hours, literally, to get an astro fix from the stars while Stanley Jones was flying the aircraft. Every time they got everything set and started shooting a star, we would run into heavy turbulence which would make their figures completely inaccurate, because the aeroplane's moving too much or, worse still, another cloud would loom up out of the darkness and all the stars would disappear. However, 'Chad' has got a wonderful approach. He's a magnificent navigator. As soon as conditions were favourable enough for him to get an accurate fix, why, there we were, only a little way off track."

The original flight plan had been to route from the Cocos Islands via Perth and Sydney to Christchurch. However, as 'Chad' recorded, Masefield said after the Cocos stop that the London-Melbourne record was still held by C. W. A. Scott and Tom Campbell-Black from the MacRobertson Air Race in 1934. Could the Viscount, he wondered, make Melbourne without the Perth refuelling stop?

There were, of course, no calculators to hand in those days,





ABOVE LEFT:
In front of *Endeavour*, 'Chad' Chadwick, standing next to his wife, holds up the author.
JOHN CHADWICK COLLECTION

ABOVE:
The interior, showing the extra fuel tanks and the navigator's work area.
JOHN CHADWICK COLLECTION

KEEPING IN TOUCH

Compared with today's almost instant communications from almost anywhere in the world and beyond, the arrangements for *Endeavour* to stay in touch back in 1953 were much more complex. Messages from all sources were co-ordinated by an operations team and were relayed by a tie-line — an old telephone connection between specific centres — to the BEA race information centre.

Throughout the flight, chief radio officer Ian Dalgliesh maintained a direct communication link with BEA in London. Signals from him broadcast in the race's earlier stages were received within two to three minutes of transmission. From points situated beyond extreme radio transmission range, messages were relayed from Bahrain, and later by way of Singapore, by Cable and Wireless.

BELOW:
London Airport, 8 October 1953, and the eight race entrants await the start. Nearest are the RAAF and RAF Canberras, followed by the RNZAF Hastings, KLM DC-6 and finally the Viscount. ALAMY



Canberra WE139, sporting race number 3, after its victorious race run. KEY COLLECTION

SPEED MERCHANTS

The race's speed section comprised five Canberras: one RAF PR7, two RAF PR3s and two Royal Australian Air Force B20s, the latter built by the Government Aircraft Factories in Melbourne, Victoria. Of those, the fastest flying time — 22 hours 23 minutes — was set by serial A84-202, a B20. But it had lost some 55 hours in the Cocos Islands waiting for a new wheel to replace one which had been damaged on landing. Next in flight time order came the favourite, the PR7, in 22 hours 26 minutes.

However, it spent more than 13 hours on the ground in Perth with generator problems. So, the eventual winner was WE139, a PR3 flown by Flt Lt Roland 'Monty' Burton and navigated by Flt Lt Don Gannon, with 22 hours 28 minutes in flight and just one hour 23 minutes of ground time. The other RAAF B20, A84-201, came second in 22 hours 27 minutes' flying, having lost time on the tarmac at Woomera with a frozen nosewheel. Third was the other PR3, flying for 22 hours 33 minutes.



Flt Lt 'Monty' Burton AFC (left) and Flt Lt Don Gannon DFC with their Canberra at Harewood Airport. RNZAF



Just 18 minutes were spent on the ground refuelling at Colombo, the capital of what was then Ceylon. JOHN CHADWICK COLLECTION

so 'Chad' would have been furiously working his dead-reckoning computer based on current track, ground speed and earlier known positions, as well as his normal slide-rule. "Careful calculations decided we could just", he wrote, "so advised Perth, Sydney and Melbourne and changed course. As we reached Melbourne and turned on finals, fuel gauge needle hit 0 stop. Actual track distance Cocos-Melbourne 3,350 miles (3,062 nautical miles) and this is a short haul aircraft!"

Arriving in Christchurch at 09.20hrs GMT (21.20 local time) on 10 October, G-AMAV completed the course in 40 hours 41 minutes of flying time, equating to an average speed of 290mph. This included the non-stop 10-hour 20-minute flight from the Cocos Islands to Melbourne's Essendon Airport, passing over Woomera. At every stop, 'Chad' said, a "'fill to spill' technique" had been used. In Melbourne, just 13 minutes were spent on the ground. The aircraft had operated at weights of up to 65,000lb (29,000kg), some 17,000lb (7,700kg) heavier than its design maximum. It set its fastest average speed, 333mph, for the last 1,580-mile stretch to Christchurch, completed in four hours 42 minutes.

After landing at its final destination, the Viscount had to be towed from the runway due to fuel starvation. There must have been some sweaty palms in the cockpit, but 'Chad's' calculations at his navigator table were rather good. What's more, G-AMAV had set an FAI class C1/1 speed record from London to Melbourne of 293.6mph, covered in 35 hours 47 minutes. It halved the 71 hours set by DH88 Comet racer G-ACSS in winning the 1934 MacRobertson race.

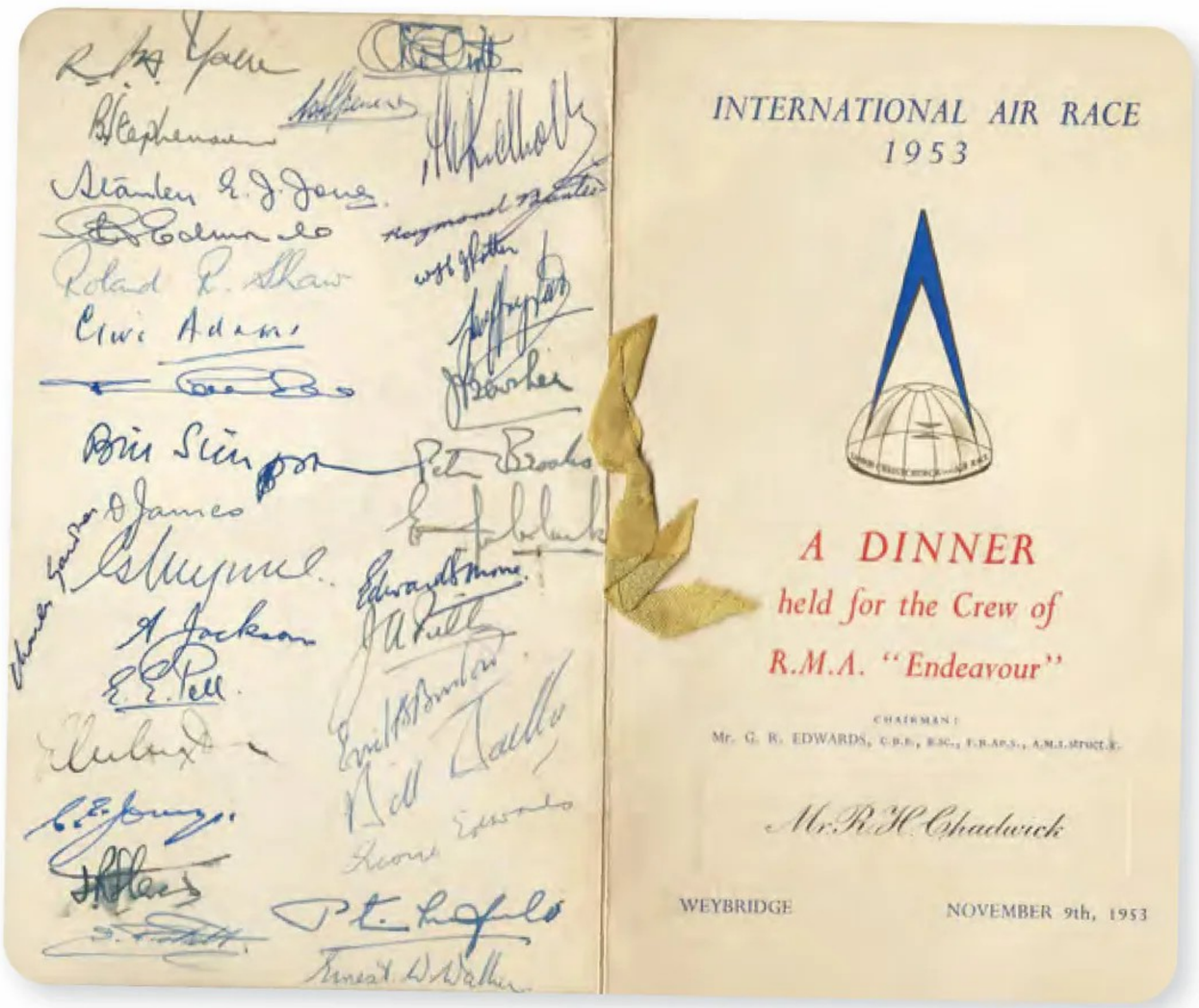
Another triumph eluded it, however. G-AMAV was by far the fastest aircraft in the transport handicap section of the 1953 race, but the DC-6 — which landed more than nine hours afterwards — won on handicap. This was because the KLM machine flew with a full load of 64 passengers who were heading for a new life in New Zealand, as well as the 10 crew, whereas the Viscount basically carried only its crew, so it lost under the agreed rules.

> ***"'Chad's' calculations were rather good"***

My father's notes explain how the victors were determined. The total distance divided by payload and all-up weight gave a time, and the aircraft able to beat its formula time by the greatest margin was the winner. From this formula, those aircraft with the highest payload in relation to all-up weight had the lowest target time. To gain range — being stripped-out and fitted with the four large fuel tanks — the short-haul Viscount had a very poor payload of around 1,000lb, whereas the DC-6's was better. "Therefore", he commented, "we had a very short formula time. On handicap they beat us easily, but

we got there first by a large margin…" And despite having "no chance of winning", it was still a "good advert for Viscount — really a publicity exercise."

Masefield wrote, "Both crew and aircraft in perfect condition and ready to go on round world immediately after standard 15-minute refuelling, if required". 'Chad's' navigating skills might have been severely tested had that happened. He had enjoyed little sleep in the previous 48 hours, and his diary entry shows how there still wasn't time for a rest: "Arrived New Zealand thinking of a nice bed only to hear Masefield say, 'Blazers and flannels, chaps, and meet in lounge in 20 minutes'. Eventually got to bed for a good sleep."



LEFT:
The signed menu from the celebratory dinner in Weybridge on 9 November 1953, billed as offering congratulations from "The men who helped to make the aeroplane…"
JOHN CHADWICK COLLECTION

The flight had explored a good deal of technically uncharted territory. The turboprop Viscount's performance would vary with temperature and climate, and the flight was a trial of the machine and its crew, particularly my father, who made so many calculations under pressure. One of the strategies for Vickers and BEA was that its performance in the race would help dictate policy for future deployment, and there is no doubt the transport handicap section contributed a great deal of knowledge, both technical and physiological, about long-distance flights to the world's airline planners. Today, an airliner's flight time to Colombo is about 10-and-a-half hours and to Christchurch around 24 hours with one stop, commonly in Singapore.

After some Viscount promotional stops on the way home — in Melbourne, Sydney, Malaysia, Ceylon, India and the Persian Gulf — *Endeavour* landed back in England at Northolt Airport on 29 October. A celebratory dinner for the BEA crew was held in Weybridge on 9 November, and there was much to laud. As Peter Masefield concluded, "This flight demonstrated [the] speed and reliability of modern British turboprop aircraft and especially BEA's standard Vickers Viscount fleet. Rolls-Royce Dart engines have completed 125,000,000 revolutions in a race without faltering or even making a noise about it."



LEFT:
Team members, looking immaculate, pose for a photo. From left to right, they comprise radio officer Eric Bristow, navigator 'Chad' Chadwick, BBC reporter Raymond Baxter, pilot Capt S. E. Jones, pilot in command Capt Bill Baillie, manager Peter Masefield, pilot Capt A. S. Johnson, radio officer Ian Dalgliesh, Vickers flight engineers Ernest Walker and Roland Shaw, and Rolls-Royce flight engineer Stanley Jones. The only man missing is John Profumo MP.
JOHN CHADWICK COLLECTION

THE FORGOTTEN POLISH



Remembering the exploits of No 302 Squadron from the Battle of Britain to the end of the war in Europe — and how they're being recalled now

WORDS: JENNY GRANT

TTEN SQUADRON

Clive Denney at the controls of the Historic Aircraft Collection's Hurricane XII, showing the port-side No 302 Squadron markings of Fg Off Julian Kowalski's MkI P3935/WX-D. DARREN HARBAR



A group photo of No 302 Squadron personnel taken during the Battle of Britain, probably at Leconfield. Standing, left to right, are Plt Off Bronisław Bernaś, Plt Off Władysław Gnyś, Plt Off Stanisław Łapka, Plt Off Edward Pilch (behind), Fg Off Wacław Król, Fg Off Jan Czerny, Sgt Antoni Beda, Plt Off Jan Maliński, Sgt Antoni Łysek (behind), Sgt Wilhelm Kosarz, Sgt Marian Wędzik, Plt Off Aleksy Żukowski, Sgt Antoni Markiewicz, Plt Off Stanisław Chałupa, Plt Off Zbigniew Wróblewski, Sgt Eugeniusz Nowakiewicz, Plt Off Włodzimierz Karwowski, Sgt Zbigniew Kleniewski amd Sgt Jerzy Załuski. Seated, left to right, Plt Off Jerzy Czerniak, Flt Lt Franciszek Jastrzębski (behind him), Plt Off Peter Carter, Flt Lt James Farmer, Flt Lt J. A. Thomson, Flt Lt Piotr Łaguna, Sqn Ldr William Satchell, Sqn Ldr Mieczysław Mümler, Flt Lt William Riley, Fg Off Julian Kowalski, Plt Off Tadeusz Czerwiński and Plt Off Antoni Wczelik. VIA WOJTEK MATUSIAK **INSET: A wartime rendering of the No 302 Squadron badge.**



Two unknown airmen with Hurricane I V6941/WX-W, which was delivered to No 302 Squadron during the Battle of Britain. It ended its career with No 52 Operational Training Unit. VIA WOJTEK MATUSIAK

The War Cabinet minutes of 12 August 1940 reported on the recent formation of two Polish fighter squadrons: 302 at RAF Leconfield, consisting of 26 pilots and 151 groundcrew, and 303 at RAF Northolt, with the same breakdown of personnel. Of the two, 302 was the first to be established, on 13 July. The Poles at Leconfield, the report states, had "already settled down" and "have shown good promise."

The unit's badge, however, proclaimed proudly that this was not, at heart, a new squadron. As with 303, its core represented the elite of pre-war Polish aviation: instructors from Deblin, many of them with combat experience from having engaged the Luftwaffe in prior theatres, namely Poland in the autumn of 1939 and France during the summer of 1940. The raven on the squadron's badge referenced that of the pre-war I/III Air Regiment at Poznan, while the number 1/145 recalled the period that the core of its personnel had spent training and fighting in France in 1939-40, most notably in defence of Paris. Now regrouping on British soil,

these airmen found themselves engaged both in friendly rivalry with their Polish comrades-in-arms for German kills and, more frustratingly, in fighting to prove themselves to their more sceptical new British colleagues.

This task was rather more difficult for 302, assigned to No 12 Group, than for its significantly better-known colleagues in 303, but the two squadrons shared a similar challenge. A detailed, rather complimentary, report on the state of Polish military aviation had been submitted to the British Air Ministry prior to the outbreak of war. This included the fact that Polish airmen were rigorously selected and as well, if not better, trained than those of the RAF. Despite this, in the autumn of 1939 the British authorities were sceptical of the skills of Polish pilots, and they dismissed their reports that the Luftwaffe had engaged in less-than-chivalrous behaviour by strafing Polish civilians and shooting down airmen as they parachuted to the ground. The Polish 'character' was seen as being unsuited to flying British fighters, being too impulsive and ill-disciplined. This, combined with a lack of familiarity with British aircraft and the language requirements of the Dowding System, meant two Polish bomber squadrons, 300 and 301, were formed well before their fighter counterparts, though individual Polish fighter pilots were able to enter existing RAF squadrons through the RAF Volunteer Reserve.

> ***"The British authorities were sceptical of the skills of Polish pilots"***

Despite the urgent need to make good the losses in the first weeks of the Battle of Britain, however, Dowding was reluctant for Polish and Czechoslovak pilots to replace British pilots within predominantly British squadrons, for fear of the demoralising effect of the 'dilution' of British numbers. Instead, the creation of dedicated Polish and Czechoslovak squadrons — once the legislative niceties had been established — served to bolster the numbers of airmen available to the RAF, to avoid dilution and, brutally, to distance the RAF from potential embarrassment on the part of the foreign squadrons.

There was, therefore, a significant mismatch between British expectations of the Poles, and the professional pride and experience of the new squadrons. From the outset, moreover, geography was against 302. In the first weeks of September 1940, assigned to No 11 Group and tasked with defending the capital and the south-east of England, No 303 Squadron had enjoyed ample opportunity to demonstrate its skills. Annoyingly quickly, from 302's perspective, it was earning plaudits among the British press, emerging as the top-scoring Allied fighter squadron in the conflict. Feted by British society, with Polish airmen rapidly becoming the most sought-after accessory for English women, the squadron became the focus of Arkady Fiedler's wartime novel, published in both Polish and English. It would later become

ABOVE:
The HAC/Polish Heritage Flight Hurricane over its Duxford home base, to which No 302 Squadron moved at the height of the Battle of Britain.
DARREN HARBAR



ABOVE: To starboard, G-HURI is marked up as Hurricane I P2954/ WX-E of Fg Off Tadeusz Chłopik. DARREN HARBAR

immortalised in the *Battle of Britain* film — "Repeat please!" — and, perhaps less memorably, in the more recent *Hurricane*.

During the same period, 302 was kicking its heels somewhat in Yorkshire. After its first engagement on 20 August, successfully taking down a Junkers Ju 88, it was largely confined to operational patrols. Wacław Król recalled how his colleagues from 303 "became famous with their multiple victories, while they had to patrol over convoys of slow ships, which they referred to in derogatory terms as 'floating junk'". On 13 September, however, sections of the squadron began to transfer to RAF Duxford, to fly as part of Bader's 'Big Wing' experiment, alongside the Canadian No 242 Squadron and the Czechoslovak No 310 Squadron, in support of No 11 Group.

This is where the Polish Heritage Flight picks up the story. Operating out of Duxford, the volunteer-led organisation was established in 2019 to tell the story of the Polish Air Force in Britain during the Second World War. Wanting to bring a human narrative to their aircraft, the team has chosen to repaint the Historic Aircraft Collection's Hurricane XII G-HURI with dual 302 markings for the 2023 season: on the starboard side, the colours of Fg Off Tadeusz Chłopik (P2954/WX-E), on the port, those of Fg Off Julian Kowalski (P3935/WX-D). Why these two airmen? "They represent life and death in the blink of an eye", mused Derek Rusling of the PHF.

On 15 September 1940, the two airmen had taken off at 11.25hrs, Chłopik as Red 1, Kowalski as Blue 3. Robert Gretzyngier's outstanding book *Poles in Defence of Britain* reports Kowalski's memories of the sortie: "Suddenly from the loudspeakers: Attention, attention.

> ***"'Attack, kill them, bastards!' 'That's Northolt', I thought"***

All Hurricane squadrons scramble. It boils up. Noise of machines starting up and taking off in sequence: Canadians, Poles, Czechs […] Under us white, neat, puffy clouds, and formations of black German bombers against that background. Some are already scattered by squadrons of Hurricanes and several are heading back South in disorder, but still more and more appear on the horizon. Great noise in my headphones. I am not listening, why would I? I don't understand a thing anyway. Suddenly, how strange, a voice in Polish, shouting 'Attack! Kill them, bastards!' 'That's Northolt', I thought. They were closer, we are flying almost on top of them. Terrible sight! I am glad I am not German."

Chłopik's combat report revealed the difficulty in correctly assigning kills. After bringing down a Dornier Do 215, he reported, "a moment later I attacked a Do 17 from behind and above. I got in a long burst and saw the port engine emitting smoke. This E/A [enemy aircraft] was attacked immediately afterwards by a large number of Hurricanes and two Spitfires."

The English translation of the combat report, however, was not signed by Chłopik. A handwritten



RIGHT: 302 re-equipped with Hurricane IIs such as Z2667 during 1941. ROBERT GRETZYNGIER COLLECTION

note below the report states baldly, "The Pilot could not sign as he was killed."

In the afternoon of that same day, Chłopik and Kowalski had taken to the skies again at 14.15, in sequence behind the Canadians and Czechs. Kowalski again: "This flight was arranged so that Tadzio Chłopik's section was the rearmost in the whole Wing… I could see first Dorniers immediately below us, so close below us that I instinctively pulled up to avoid collision… I could hear Chłopik calling Bader in English. I didn't understand what he was saying, but I am sure he reported the Dorniers below us. Having no answer, Tadzio shouted, this time in Polish: 'Attack', with a simultaneous turn backwards. Knowing Tadzio, I was ready for it and the whole trio turned back. Tadzio chose to attack the middle line of the Dorniers, and me and Stasio found ourselves among the formation lines. Since our speed after the turn was reduced to zero relative to the Germans, the Dornier that flew at the back crashed into Tadzio's aircraft. A great explosion followed, and debris from the Hurricane and Dornier sank in the clouds… In the evening news came that the body of Tadzio Chłopik was found in the Thames Estuary."

Chłopik's body, in fact, was found at Rawreth, near Rayleigh in Essex. His Hurricane had crashed into Marks Farm in Battlesbridge. The accident report recorded, "His body was found at some distance from the aircraft, his parachute had not been pulled and it is assumed that he had sustained some injury when abandoning the aircraft which rendered him unconscious". In just a year, the war had taken the 32-year-old from Poland to Romania, and then on to France and the UK, before he was laid to rest in the cemetery at Southend-on-Sea. On the day of his death, Chłopik was credited with destroying one Do 215 and sharing in the destruction of a Do 17 with Flt Lt Jastrzebski.

In contrast, Kowalski's fate would map that of 302 until August 1942, and he would survive the war. His hopes of returning to a free Poland were destroyed by the communist takeover and he rebuilt his life in the UK, starting a family and working for Ransomes, Sims and Jefferies; he died in 1986. Therein lies the fascination for the Polish Heritage Flight: "Same day, same aircraft, two completely different outcomes."



By 1942, of course, the role of the squadron had evolved significantly. On 11 October 1940 it transferred from Leconfield to Northolt, relieving 303. However, the hunting season was nearly over. A significant reorganisation took place over the winter, with Piotr Łaguna assuming the position of squadron leader and Kowalski and Tadeusz Czerwinski taking over as flight commanders. For Christmas Eve, or Wigilia, in 1940, the British station officers organised a surprise dinner for 302. Between rationing and a glitch in cultural and culinary awareness, a number of mistakes were made: kippers were marinaded instead of herring, for example, but it certainly attests to the goodwill which existed between the Polish airmen and their British counterparts. On New Year's Eve of 1940, the squadron could reflect on its record to date: 27 enemy aircraft destroyed, 11 probables, two damaged; seven Polish pilots and one British pilot lost.

In early 1941, we enter our second stage. Now stationed at RAF Westhampnett, 302 ran a series of convoy escorts and patrols over Southampton and Portsmouth, while it was still scrambled to take out the occasional overly curious Junkers. To ease the frustration, 302 was, at least, a hit with the locals, to the extent of having to draw up a schedule for which airman should make an appearance at the many social events they were invited to.

On 5 February, it undertook a new type of operation, forming part of the escort for 24 Blenheims as they targeted the airfield at Saint-Omer, as part of a 'Circus' mission. From Easter, the squadron finally enjoyed something resembling down-time when it transferred to RAF Kenley. Plt Off Jan Jokiel was then serving as the squadron's Polish intelligence officer; he would later return to Poland as one of the Cichociemni, working in air intelligence in occupied Poland. His 1968 memoirs describe 302's arrival at Kenley. The squadron wanted to turn up in style and impress the English pilots by arriving in a formation of nine aircraft, each set of three landing at the same time. Despite the narrow airfield and short roll-out, they managed this to perfection. The need to establish their credentials from the outset was all-important.

Delighted to have left Tangmere, they nonetheless mourned the loss of their Easter pig. Like many British civilians, they had formed their own pig club, feeding up young Peppa until she could be butchered, as a way of supplementing the meat ration. Sadly, the pig had to be left behind, and a miserable, meat-free Easter beckoned until the squadron was able to call on its connections, legitimate or otherwise, with the Reubens Hotel, the Polish HQ in London, and the finest sausages and ham duly arrived.

Overall, Jokiel remembers the short time spent at Kenley with fondness: "The mood in the squadron clearly improved at

ABOVE:
The new markings on Hurricane 5711/G-HURI were applied by Vintage Fabrics at Audley End, Essex, where it became the first example of the type ever to land.
DARREN HARBAR





RIGHT: **No 302 Squadron's then CO, Sqn Ldr Stanisław Łapka, being prepared for a sortie out of Hutton Cranswick in Spitfire Vb EN865 during March 1943.**

BELOW RIGHT: **Spitfire IX MH869/WX-R over France in early 1944, photographed from one of the AAF B-17s it was escorting.** USAF

the new airfield. People felt better and immediately their good mood returned. Well, they finally left Tangmere, which was already a cause for joy. Besides the weather was beautiful and sunny, and the hosts welcomed them with warmth. Quiet pace without the surprise attacks from the sky at night allowed me to be reminiscent of the time passed in a more insightful fashion, and try to recap all the things we'd experienced since August 1940."

With the warmer weather, however, the number of scrambles increased. The squadron's role now varied between scrambles, patrols, escorts, and ground attack sorties over France. From August, flying out of Church Stanton in Somerset, it joined the 2nd Polish Fighter Wing escorting bomber missions over Cherbourg and Brest. In October, the squadron received its first Spitfires. Adam Zamoyski describes how 302 built a reputation for effective close cover, and was often detailed to escort royal or VIP flights. When Churchill was flying back from North Africa in 1942, he writes, the squadron was withdrawn from its wing and sent to escort his aeroplane.

The lull in attacks by the Luftwaffe was compensated for by the arrival of the US Army Air Forces in the UK, with a greater intensity of day operations taking place against German forces on the continent. In May 1942, the squadron took part in the Dieppe raid, and with increasing Allied air superiority it began to accompany B-17 Flying Fortresses on daylight bomber sorties over Germany.

It was upgraded to the Spitfire IX come September 1943, and was the subject of a fairly intensive photo-shoot at RAF Hutton Cranswick. Though early support for the Poles was waning to a degree — and their novelty had worn off as first the Canadians and then the Americans arrived on British shores — the photographs clearly attest to the continuing international perspective of the British. They were taken by a British press agency photographer, rather than the Polish Ministry of Information. Indeed, in the autumn of 1943 we see the Battle of Britain being celebrated by an official parade for the first time; the international nature of the RAF was emphasised significantly.

At this point, the Polish squadrons began to prepare for D-Day and the invasion of the continent. 302 was attached to No 131 Fighter Wing within the 2nd Tactical Air Force, and the nature of its training changed, moving to a fighter-bomber role in order to support the Allied land forces. There was an increased focus in particular at flying at low altitudes, developing visual co-ordination and map flying skills, since it would now lack the support of an operations room. In

> ***"302 built up a reputation for providing effective close cover"***

April 1944, training intensified. The airmen began to get used to life in tents, grass airstrips, and preparing to break camp quickly.

On D-Day itself it flew four patrols, and 302 became the first Polish squadron to land on European soil on 11 June, as it touched down to refuel in France. The significance of this for the Poles cannot be underestimated. Surely this would be the first symbolic step towards the liberation of Warsaw? The majority of Poles in the UK who had been evacuated from France in 1940 had not since had the opportunity to set foot on the European mainland; their families remained under occupation, if indeed they were still alive. Like the Czechs, the Poles hoped the Allied advance would continue to push past Berlin and allow them to liberate their homeland. Gen Maczek's 1st Polish Armoured Division codenamed the French, Belgian and Dutch towns to be liberated after Polish towns and cities, for example. For the Poles, then, mainland Europe was not simply the stage on which the Nazis would be defeated but their cultural and geographical home.

The summer of 1944 was, unsurprisingly, rather busy for 302. Pilots flew two or three times a day, while groundcrew were working throughout the long summer days, and then continuing their work by torchlight. In early August, the wing moved to the north of Caen. Its strips were now in range of German artillery, living conditions were alternately muddy or dusty, and they



barely slept due to artillery barrages. During all of this the Spitfires continued to fly a number of sorties each day, attacking enemy troops, depots and river crossings. Rather wonderfully, in the middle of August, they supported Maczek's division during the final stages of the Battle of Falaise.

The squadron took delivery of the new Spitfire XVI during early 1945. The intensity of operations continued; it lost two commanders, Bienkowski and Olszewski, on operations. As the Allies advanced towards the German heartland, Krol describes how "the squadron's contribution to this destruction was significant, and pilots flew with a great zeal and determination even in unfavourable weather conditions, making up for the invasion of Poland in September 1939."

Remaining as part of the British occupying forces until the end of 1946 before returning to England, 302 finally disbanded in 1947. But what then? *Hurricane* misleadingly suggests the Poles were threatened with forced repatriation at the end of the war, a wild misinterpretation of the concept of the Polish Resettlement Corps. The British government, however grudgingly, agreed to offer sanctuary to Polish servicemen and women once it was clear Stalin would not allow Poland to regain its former sovereignty. A quarter of a million Poles were serving under British command, from Italy to Scotland. Those without direct experience of Siberian deportation, whose homes still lay within the newly drawn Polish borders, were more likely to choose to return to Poland.

Of the Polish airmen from 302 who took to the air in the morning of 15 September 1940, nearly half were dead by 1942. Those who survived went on to live long lives. A fifth returned to Poland, while the rest remained in exile, in the UK or New Zealand. The prospects for younger airmen and groundcrew in the post-war world were bright, as commercial air travel resumed, and newly independent countries established their own air forces. For those who returned to Poland, however, life was less kind. Wacław Król, for example, initially worked for LOT, the Polish national airline. Like many Polish airmen, however, he fell under suspicion of espionage in 1949, and found employment as a shopkeeper until being rehabilitated in 1957.

While the legacy of 303 has swum against the tide of popular memory somewhat, it remains the case that the contribution of foreign airmen and groundcrew to the RAF plays a smaller role in British understanding of the war than it should. In the Battle of Britain alone, Britain and the Commonwealth were joined in the skies by men from Belgium, Czechoslovakia, France, Ireland and Poland. Post-war, the Air Ministry lobbied hard for these airmen to be invited to the London Victory Parade of 1946.

It is best, perhaps, to end with Viscount Stansgate, the Secretary of State for Air, who argued, "The participation in the March of contingents of those European Allies who had been fighting under Royal Air Force command during the war should be an education for those Allies as well as for our own people. In my view the international flavour of the Royal Air Force should be preserved and acknowledged."

For more information on the Polish Heritage Flight, visit polishheritageflight.com

ABOVE:
George Haye flies the HAC Hurricane with Trev Dugan off his port wing in Spitfire IX TE517, sporting its original No 313 (Czechoslovak) Squadron scheme — a powerful tribute to the sacrifices of Polish and Czechoslovak airmen in the wartime RAF, and their struggles thereafter.
DARREN HARBAR

TRIAL AND ERROR

The first edition of the Lympne light aeroplane trials took place 100 years ago — and didn't exactly swing a lamp over the future. How did the correspondents of the time view it?

WORDS: BEN DUNNELL

Women's emancipation was not a concept to which C. G. Grey devoted a great deal of thought. The many feats of female aviators during his tenure as editor of *The Aeroplane* often drew short shrift, if not downright bigotry. Even in the wake of the first Lympne light aeroplane trials — officially described as competitions for 'motorgliders', a rather different sense of that term than we know today — he could not resist putting into print an unnecessary slight.

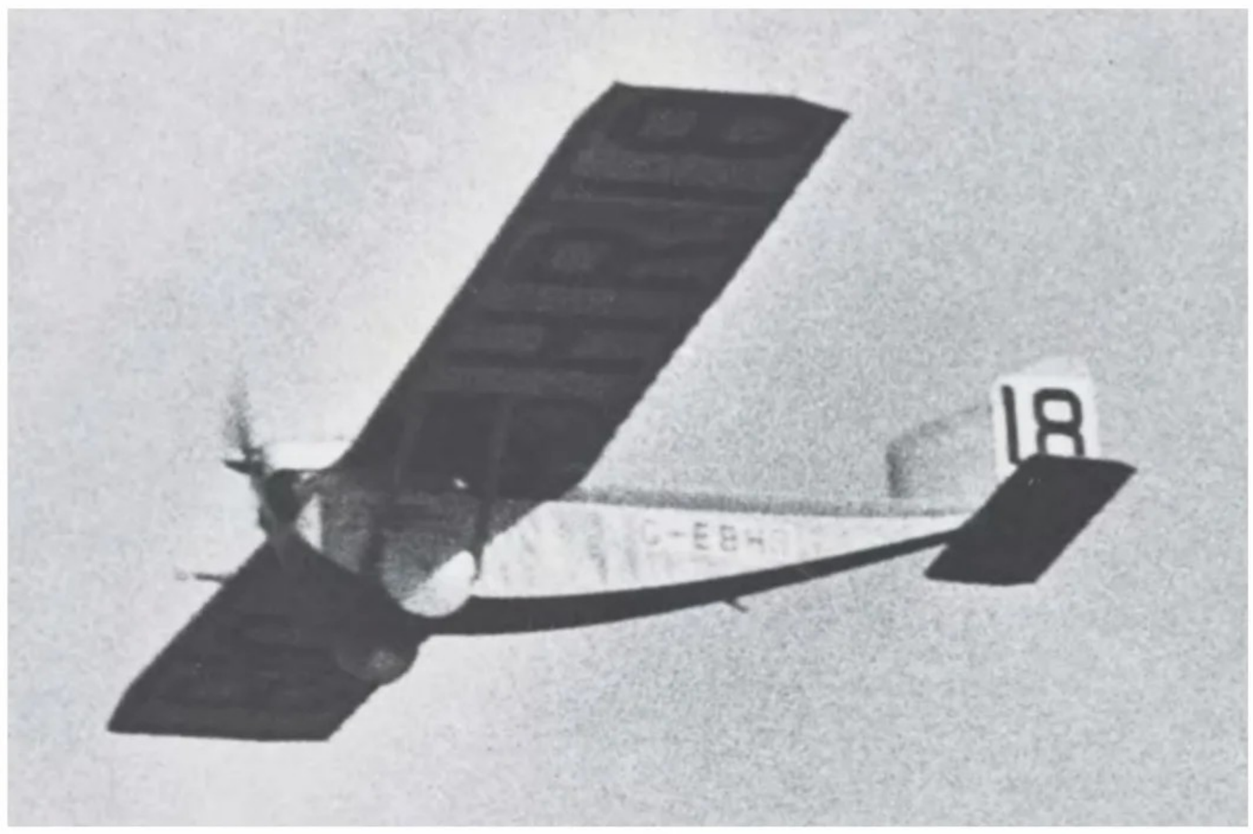
"There are sundry optimists in the Trade", he wrote in the 17 October 1923 edition, "who think that these Competitions open up a new era in Civil Aviation. They believe that there is a market for motorgliders if they can be put on the market at a reasonable price — say £200 or thereabouts. On this point one entirely disagrees, for the optimists entirely disregard the fact that for practical purposes there is no market for a single-seater motor vehicle of any kind. And this is due to the psychological fact that as soon as a mere male has enough money to buy and maintain a motor vehicle he promptly becomes an object of interest to some designing female.

"A number of single-seater motor-bicycles are sold, but how many continue to be single-seater? In a very short while the owner is compelled to attach a side-car, or if he cannot afford one he fits that species of pillion arrangement which is vulgarly known as a 'flapper-bracket'. Single-seater run-about cars have been put on the market, but invariably after a little time a woman



One of the star performers at Lympne in 1923, English Electric Wren number 4, was the joint overall winner of the economy contest. The Vickers Viget sits in the background. VIA PHILIP JARRETT





perches herself on the back or the owner buys a two-seater. And as one cannot perch a passenger on the back of a motorglider it follows that the light aeroplane of the future must be a two-seater."

In any case, Grey doubted "very much whether there can be much of a market for privately-owned light aeroplanes. The makers may produce two-seaters for the benefit of the designing female aforesaid, but even then it is hardly likely that enough can be sold to make them worth while. The trouble is that they have to be flown from an aerodrome of some sort and they cannot be run out of a garage like a car and started straight away on a journey.

"Some few landed gentry may have usable aerodromes in their own parks just outside their hall-doors and their sons may take a fancy to flying motorgliders. But the number of such sportsmen cannot be large. Here and there small flying clubs may be formed near big towns where the sons of well-to-do merchants may run several machines on the co-operative principle. But even in this way the demand cannot be considerable as a factory proposition…

"Also, nothing is so boring as flying after use has worn away the first novel sensations. When that stage is passed flying becomes simply a quick and comfortable way of getting about the country. And the man who can only afford a motorglider cannot afford to spend half of his time touring about the country for fun. Therefore the motorglider must spend most of its time doing nothing. Which is a bad investment."

But if Grey's underlying rationale was deeply anachronistic, the ability for a light aeroplane to carry more than just its pilot would indeed prove desirable. And few could argue with his remark that, "despite the high performances which were got out of the machines at Lympne it was evident that none of them could be made into two-seaters and remain a useful vehicle. Nor, indeed, that "the motor-cycle engine is neither big enough nor reliable enough for a flying machine when judged by the standards of the modern aero-engine."

It had been the Duke of Sutherland, then Under-Secretary of State for Air in Stanley Baldwin's first government and vice-president of the Royal Aero Club, who kick-started the Lympne contests. Following on from the club's gliding competition at Itford Hill in the summer of 1922, he was the driving force behind a £500 official award for the most economical British aircraft in an equivalent event aimed at what were termed "low-powered aeroplanes". That definition was kept deliberately loose, but given the 750cc maximum engine capacity, power outputs would remain strictly limited. Specifically, the winner would be the machine that completed the most laps of a 12.5-mile course on one gallon of petrol. The *Daily Mail* pledged £1,000 to the victor, this time no matter which country it hailed from. Sundry other monetary prizes were offered for the best speed, distance, height, short landing and overall lap count.

Before flying, each entrant had to undergo several ground transportation tests. These, said Grey, "consisted of taking the wings off the machines and transporting them and the rest of the machine through a gate into a field and back, a distance of a mile, in three hours". And while being moved by road, each aircraft was not to occupy "more than half of a fifteen-foot roadway."

From the moment they began, at 07.00hrs on Monday 8 October,

LEFT:
Dressed to withstand the elements, which were decidedly unpleasant at times, Harold Hemming climbs into DH53 *Sylvia II* while talking to a contest marshal. This was the second example of the type built. VIA PHILIP JARRETT

BELOW LEFT:
ANEC I G-EBHR demonstrated outstanding performance on its 698hp Blackburne Tomtit, co-winning the economy competition and taking the altitude prize outright.
VIA PHILIP JARRETT

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ABOVE:
The number 11 Avro 558 sits on its makeshift 'dolly' undercarriage.
VIA PHILIP JARRETT

representatives of *The Aeroplane* were among those gathered at Lympne to witness proceedings. The journal's contest diary provides a splendid period account of a pioneering occasion.

Monday 8 October

On English Electric Wren number 4, Flt Lt Walter Longton was first into the air for an economy run. In a light wind, he proceeded to complete several circuits of the course, covering 87.5 miles and spending two hours 40 minutes aloft. *The Aeroplane* reported, "on the last leg of the last lap he finished his gallon and turned on his spare pint. He landed and went into the measuring hangar to have his consumption measured and worked out by Dr A. R. Low who was the official measurer. Shortly after it was announced that he had done 80.3 miles per gallon."

> ***"Interest centred on the 'Snakes and Ladders' Competition"***

Could others do better? With the second Wren, Sqn Ldr Maurice Wright notched up 71mpg, Fred Raynham on the Handasyde 65.7, Bert Hinkler on the Avro 560 monoplane 54.6, Geoffrey de Havilland on the DH53 50.8 and Maj Harold Hemming on a similar machine 50. Capt Norman Macmillan suffered engine trouble on the Parnall Pixie and achieved 49mpg. Early attempts on the speed prize saw an ANEC I reaching 66.5mph with Jimmy James up, and Hemming 57.5mph on the DH53. Harold Hamersley's Avro 558 biplane laid down a marker for the height contest at 6,300ft, as well as "flying up and down for some considerable time with both his hands above his head."

The Vickers Viget, flown by Stan Cockerell, had a troubled outing: "after a couple of circuits he had a forced landing near Brabourne. He folded the wings of the machine himself and then proceeded to push it home six miles along the road. It is said that in one place he stopped at a 'rest house' for refreshment in his arduous labour and when he came out he found a number of people waiting who asked him when the performance was going to start. On asking what they meant he was informed that they were under the impression that the object that he was pushing was a Punch and Judy Show."

Tuesday 9 October

James, flying early and "in quite a strong wind", set a new 87.5mpg benchmark with an ANEC. This went unbeaten for the remainder of the event, only being equalled. Otherwise, "Nothing very exciting happened on Tuesday and interest was chiefly centred in what was dubbed the 'Snakes and Ladders' Competition", for "the machine that covered the greatest number of laps. If a machine piled up say 30 laps and then a portion of the machine or engine had to be changed the pilot had to go back again to the beginning and start again". Hinkler with the Avro monoplane, Hemming on the DH53, and James and Maurice Piercey flying the ANEC were the main protagonists. "The competition waxed fast and furious and all three machines kept within a lap of one another until at lunch time Major Hemming broke a crankshaft, 'got on the head of a snake' and so had to go back to the beginning."

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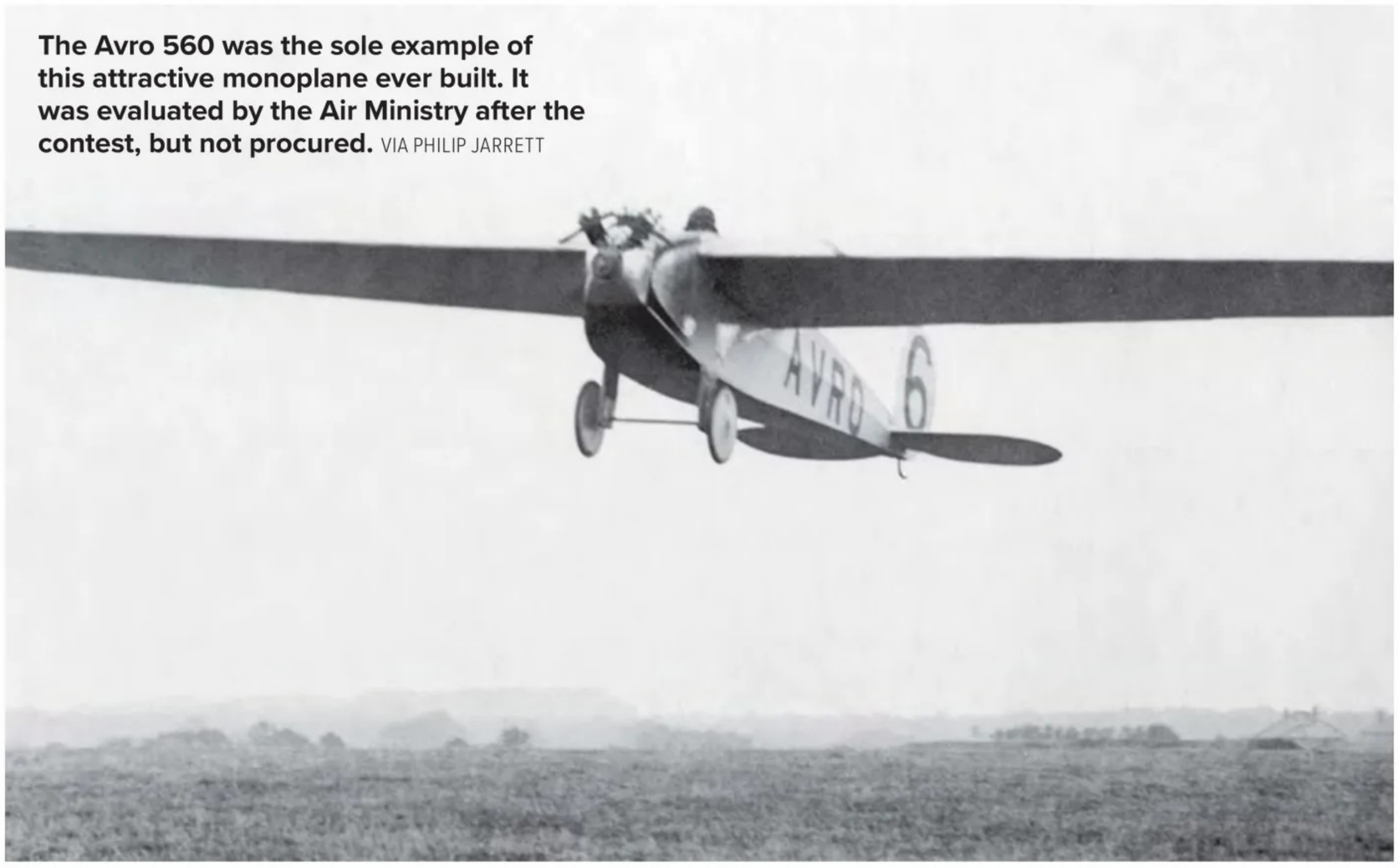
Wednesday 10 October

Despite "squalls and gusty rains", Longton flew Wren number 4 in the morning and achieved a fuel consumption figure of 90.5mpg. However, "as he had to land after five circuits and did not use the whole of his gallon this figure could not stand". Conditions were far from easy, and Rex Stocken force-landed his Gnosspelius Gull. It remained undamaged and was returned to Lympne by road.

While all this was going on, Hinkler "was steadily going round and round the course piling up laps in the 'Snakes and Ladders' Competition in which he was now leading easily. About midday the wind dropped and a thick fog with a visibility of 100 yards came down. This did not seem to worry Mr Hinkler in the very least and he went on steadily until Mr A. V. Roe grew anxious as to his safety. Finally Mr Roe could stand it no longer and when next Mr Hinkler appeared Mr Roe with one accord dashed out onto the aerodrome and shouted him down."

Larry Carter got airborne in the Gloucestershire Gannet, on which the two-stroke Carden engine had been playing up. "Mr Carter took off in the direction of the sea and as he got over the cliff the mist closed right down. Much anxiety was felt for his safety but after about ten minutes he appeared from the other direction and landed safely. Had the engine been running properly this little machine would no doubt have given a brilliant account of itself. Both for workmanship and general lines it was one of the prettiest machines present."

Steadily the weather worsened, and a degree of chaos set in. "At about two o'clock the wind sprang up and cleared the fog but the wind went on rising until by 14.30 hours it had touched gale force. Just before the fog Major Hemming flew past the enclosure and shouted down that Mr Broad had had a forced landing and it was ascertained that the reason for this was a broken rocker-arm. He also located one or two other machines which were lost on the ground in the fog. When the gale was at its height Major Hemming with the spare rocker flew off and dropped this to Mr Broad who after 20 minutes or so effected his repair and flew back to the aerodrome. The way the two de Havillands flew and landed in the gale was perfectly



The Avro 560 was the sole example of this attractive monoplane ever built. It was evaluated by the Air Ministry after the contest, but not procured. VIA PHILIP JARRETT



Bert Hinkler was almost constantly airborne in the Avro 560 when conditions allowed. VIA PHILIP JARRETT



Folding wings were a feature of the Gloucestershire Gannet, but good performance was not. VIA PHILIP JARRETT

LYMPNE 1923: RUNNERS AND RIDERS

Entry number	Aircraft	Engine	Pilot(s)	Results
2	Gnosspelius Gull G-EBGN	698cc Blackburne Tomtit	John Lankester Parker	Speed: 55.25mph
3	English Electric Wren G-EBNV	400cc ABC	Sqn Ldr Maurice Wright	Consumption: 82.5mpg Mileage: 175 miles (14 laps)
4	English Electric Wren	400cc ABC	Flt Lt Walter Longton	Consumption: 87.5mpg — tied with number 18 for Sutherland and *Daily Mail* prizes, £750 Mileage: 362 miles (29 laps)
5	A. V. Roe and Co Model 558	B and H	Bert Hinkler	No official figures; flew very little
6	A. V. Roe and Co Model 560	698cc Blackburne Tomtit	Bert Hinkler	Consumption: 63.3mpg Mileage: 1,000 miles (80 laps) — winner of trophies for most laps and longest distance, £300
7	Gloucestershire Gannet G-EBHU	Carden	Larry Carter	Flew but engine trouble prevented official tests
8	de Havilland DH53 G-EBHX	750cc Douglas	Capt Geoffrey de Havilland and Capt Hubert Broad	Consumption: 50.8mpg Mileage: 100 miles (eight laps)
9	Parnall Pixie G-EBKM	500cc Douglas	Capt Norman Macmillan	Consumption: 53.4mpg Mileage: 125 miles (10 laps)
10	Vickers Viget G-EBHN	750cc Douglas	Capt Stan Cockerell	Speed: 58.1mph
11	A. V. Roe and Co Model 558 G-EBHW	500cc Douglas	Capt Harold Hamersley	Altitude: 13,850ft — second altitude prize, £100
12	de Havilland DH53 G-EBHZ	750cc Douglas	Maj Harold Hemming	Consumption: 59.3mpg Mileage: 387 miles (31 laps)
13	Handasyde monoplane	750cc Douglas	Fred Raynham	Consumption: 65.7mpg Mileage: 162 miles (13 laps)
14	RAE Aero Club Hurricane G-EBHS	600cc Douglas	Flt Lt 'George' Bulman	Speed: 58.5mph
15	Peyret monoplane	748cc Sergant	Alexis Maneyrol	Altitude: 9,400ft
16	Poncelet Vivette O-BAFH	748cc Sergant	Baron Georges Kervyn de Lettenhove	No figures
17	ANEC I G-EBIL	698cc Blackburne Tomtit	Jimmy James and Maurice Piercey	Cracked a cylinder early in the meeting and thereafter kept in reserve to No 18
18	ANEC I G-EBHR	698cc Blackburne Tomtit	Jimmy James and Maurice Piercey	Consumption: 87.5mpg — tied with number 4 for Sutherland and *Daily Mail* prizes, £750 Mileage: 775 miles (62 laps) Speed: 74mph Altitude: 14,400ft — winner of altitude prize
19	Gnosspelius Gull	698cc Blackburne Tomtit	Capt Rex Stocken	No figures
21	Poncelet Castar O-BAFG	748cc Sergant	Victor Simonet	Speed: 58.1mph
24	Parnall Pixie MkII G-EBKN	750cc Douglas	Capt Norman Macmillan	Speed: 76.5mph — winner of speed prize, £500
25	Sayers-Handley Page monoplane	400cc ABC	Gordon Olley	Mileage: 37.5 (three laps)

Note: the missing numbers in the above sequence, and those from 26-28, relate to aircraft that were entered but did not show up

extraordinary and both pilots were congratulated on their flights by the Duke of Sutherland."

Thursday 11 October

Again starting early, Longton once more showed the performance of the Wren, equalling James's 87.5mpg. The weather thereafter precluded any serious attempts on their fuel consumption benchmark, though the Sayers-Handley Page HP22 — erected overnight and put through its transport tests that morning — looked as if it might challenge. "It had been arranged", said the report, "that the machine should be catapulted off the ground in the manner of the gliders at Itford Hill last year… She was lapping in about 16 minutes and it appeared as though she would be a very dangerous competitor in the consumption test but half-way round the third circuit a rocker-bracket worked loose and in that condition Mr Olley who was flying her brought her back to within a few yards of the aerodrome just failing to get over the final fence, a performance which showed that she had a very high efficiency."

The Parnall Pixie had been transformed overnight from number 9 to number 24, "by taking off the big wings and fitting a smaller pair — and taking out the low-powered Douglas and fitting a bigger one. The performance of the machine was watched with much interest as few people believed that it could possibly fly with so little surface. However it took off in a surprisingly short distance and proved to be very manoeuvrable in the air. Mr Macmillan completed the two circuits necessary for the speed flight at 76 miles an hour though on the straight the machine must have been doing very nearly a hundred and finished with a beautiful landing". Later it was reconverted to its previous configuration for the fuel consumption attempt, but the weather prevented this, so it was changed back again.

Friday 12 October

"Owing to the gale and the storm", *The Aeroplane* recorded, "there was no flying on Friday and interest was centred on the sea."

Saturday 13 October

The climactic day, and a tragic one, with the death of Alexis Maneyrol in the Peyret monoplane. In the

morning he had snatched the lead of the altitude contest, at 9,500ft. After Piercey and Hamersley went still higher, Maneyrol tried again. As he came in to land, "at a hundred feet or so both wings folded back simultaneously and the machine fell like a rocket-stick. Officials and doctors rushed across to the spot but M. Maneyrol died a few minutes later. There is very little doubt that the machine was of too weak a construction and one was informed by an official of the Air Ministry that if competing machines had had to be passed as airworthy before they were allowed to fly the Peyret machine would not have been allowed to ascend."

It had earlier appeared as if Baron Georges Kervyn de Lettenhove might become the meeting's first casualty, when his Poncelot Vivette monoplane "was beaten down to the ground. A wing-tip caught the ground and the machine turned clean over. It looked like a serious accident at first, but the bold Baron crawled out completely unhurt and like Oliver Twist asked for more. Unfortunately, a completely casséed rudder foiled his ambitions."



The Parnall Pixie in its large-winged configuration, with contest number 9. VIA PHILIP JARRETT



Of three Sayers-Handley Page monoplanes entered, only number 25 took part, Gordon Olley at the controls. VIA PHILIP JARRETT


ABOVE: Stan Cockerell with the Vickers Viget. The First World War RFC ace had joined the company as a test pilot. GETTY

As the day wore on, and time ran out for any further tilts at the economy prizes, more attention turned to the speed and altitude contests. While Macmillan reached 82mph on a test circuit, the Pixie's Douglas engine "gave trouble" half-way round his second official lap, leading to a forced landing. He still ran out the winner on speed, however, the 78mph he set on Thursday going unbeaten.

Unwanted excitement was caused mid-afternoon, when Raynham's Handasyde, Hemming's DH53 and the ANEC of Piercey "were all seen to be coming down together with their airscrews stationary". *The Aeroplane*'s correspondent suggested to an official that those aircraft sitting in front of the public enclosure should be moved to prevent their being damaged in the event of landing mishaps, or people sent out to form a protective cordon. "Piercey coming down numbed with cold overshot his landing and went straight at the waiting machines. Mr A. B. Rogers the representative of British Petroleum petrol at Croydon who was looking after the firm's interests at Lympne pluckily stood in the way of a wing tip of the machine and swung it round so that the nose of Mr Piercey's machine only caught the tailplane of Mr Broad's de Havilland and damaged it slightly, very slightly damaging a wing of Mr Piercey's machine also… Mr Rogers got a bad bump in the chest which laid him out for the moment but he soon recovered."

Before all that, Piercey had been to 14,500ft and Hamersley to 14,000. Maneyrol's accident led to the abandonment of the planned formal dinner and ceremony that evening, but there was an informal prizegiving at Lord Edward Grosvenor's home. Having just missed out on the altitude award, Hamersley received a second prize of £100 for his efforts, rustled up by the Duke of Sutherland and other Royal Aero Club members.

Inevitably, some of the aircraft impressed more than others. Not among the official winners, the DH53s gained many plaudits, not least for Hubert Broad's displays, described as including "looping, rolling and, spinning as though



ABOVE: Members of the RAE Aero Club at Farnborough designed the Hurricane, about which *The Aeroplane* commented, "though she looked quite fast on the ground there was not really very much 'hurry' about her". It added, "That triangular fuselage is all wrong."
VIA PHILIP JARRETT

it were any ordinary high-powered aeroplane". *The Aeroplane* added, "It seems a pity that the two de Havillands were not awarded a special prize for general utility as their general handiness, controllability, and flying qualities singled them out for very special comment. Nevertheless it seems probable that they will reap their reward in orders". The reporter cited talk of potential RAF training use. C. G. Grey's summation was pithy: they were, he opined, "the best all-round machines of the Meeting", but "not powerful enough for the Speed Prize", "not 'cleaned-up' enough for the Consumption Prize", and "not light enough for the Altitude Prize."

The Wrens, too, caught the collective attention. Langton's "wonderful exhibition of his famous crazy flying [...] utterly startled everybody who had no idea that [it] had such wonderful qualities as a flying machine. The lack of noise from the little ABC engine and the curious antics of the machine irresistibly reminded one of a moth fluttering round a candle". As Grey pointed out, "They are not and do not pretend to be all-weather cross-country machines". But, he felt, "a modified motorglider of a similar type with a bigger engine would be a very nice flying machine..."

> ***"No one of them was a freak in general design"***

In their debut showings, the ANEC Is illustrated the ability of the Air Navigation and Engineering Company's William Shackleton. "They were designed and built for aerodynamic efficiency and they achieve the designer's object", remarked Grey. "The pilot is tucked away right inside the fuselage and has in consequence a very limited outlook ahead and none at all upwards so they are not ideal cross-country machines. But they do fly amazingly well". He marvelled at how the ANECs, with a 698cc engine, both matched the 87.5mpg of the smaller-engined Wren and got to 15,000ft. Similarly, the Pixie was the first civilian aircraft conceived by Parnall company designer Harold Bolas, and "well deserved the speed prize."

Avro's offerings managed fine feats of flying, the 560 monoplane's success in the aggregate mileage stakes being down, Grey wrote, to the "energy and determination" of Hinkler in continuing trouble-free lappery through all weathers. Yet it was, he commented, "a very good practical cross-country machine". The Douglas-engined 558 biplane "was taken to amazing heights" by Hamersley, whose airmanship also attracted significant admiration.

What of the rest? Grey concluded of the Handasyde, "There is nothing startling about it, but it does fly thoroughly well". He thought much the same of Vickers' Viget: it "flew excellently but not quite well enough to win anything". The small team from the RAE Aero Club created in the Hurricane "a machine for a trained pilot", but one in need of a bigger engine. Given the greater experience of Oscar Gnosspelius, the Gull "hardly came up to expectations". It "seemed to be unduly tricky to control, especially fore and aft". Maladies afflicting the Gloucestershire Gannet's Carden motor kept it largely ground-bound. The Sayers-Handley Page monoplane, later dubbed the HP22, "had been altered a good deal from the original design and it evidently needs to be re-altered before it

TITANINE DOPE
and
LYMPNE MOTOR GLIDER TRIALS,
8-13th October, 1923.
The following successful machines were coated with TITANINE DOPES:—
Daily Mail £1,000 Prize and Duke of Sutherland's Prize, £500.
WINNERS.
J. James, A.N.E.C. Monoplane tied with Flight-Lt. Longton, WREN Monoplane.
87.5 miles per gallon.
£300 Prize for Mileage. FIRST, SECOND AND THIRD.
B. Hinkler, AVRO Monoplane - - 1,000 miles.
J. James, A.N.E.C. Monoplane - - 775 ,,
Flight-Lt. Longton, WREN Monoplane - 362½ ,,
£200 Altitude Prize. FIRST AND SECOND.
M. W. Piercey, A.N.E.C. Monoplane - - 14,400 feet.
F/O. Hamersley, AVRO Biplane - - 13,856 ,,
SPECIAL DOPING SCHEMES FOR ANY PURPOSE OR CLIMATE.
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Telegrams: "Tetrafroe, Picey, London."
Works { Hendon (London) / New Jersey (U.S.A.)

will fly well". Belgium's Poncelet monoplanes were "a distinct credit to their country… their general design and construction are good". On the subject of the ill-fated Peyret, Grey felt it "as well to say as little as possible."

The previous year's Itford glider meeting — apart from being announced at short notice and attracting few entries — had been notable for the outlandish, or downright poor-quality, designs on display. Lympne, with certain exceptions, saw little of that. Even Grey acknowledged, "Taking them all round the machines were a very good lot". *The Aeroplane*'s technical editor William H. Sayers noted, "Very few machines showed any abnormality in the design or proportion of their control surfaces, and no British machines showed any sign of lack of control. The majority showed abnormal controllability."



AVRO

Another Avro Success!

Light Aeroplane Competitions at Lympne, October 8-13, 1923.

The Avro Monoplane Motor Glider.

IN the Light Aeroplane Competitions, held at Lympne October 8th and 13th, the Avro Monoplane Motor Glider, Type 548, fitted with a 6 h.p. Blackburne engine, piloted by H. Hinkler, won the prizes presented by the R.M.M. & T. and R.C. & M.C. & M.C.M. & T.U. Ltd., for the greatest number of completed circuits of the course, by flying 84 circuits, representing 1,000 miles.

THIS feat was carried out under the most adverse weather conditions, and gives infallible proof of the airworthiness of this wonderful little machine.

IN the ALTITUDE COMPETITION the Avro Biplane Motor Glider, Type 538, fitted with a 500 c.c. Douglas engine, piloted by F/O Hamersley, was awarded second prize. It attained an altitude of 13,850 feet which constitutes a record for a machine fitted with a 500 c.c. engine.

THESE successes prove once more the reliability of Avro machines, and uphold the manufacturers' reputation as the pioneers in the design and construction of the world's best aircraft.

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Experimental Works:
HAMBLE, SOUTHAMPTON.

The Avro Biplane Motor Glider.

The D.H. Type 53

736 c.c. DOUGLAS ENGINE *or* 698 BLACKBURN ENGINE

"THE two De Havilland 53s, were by general opinion considered to be the best all-round machines of the meeting, which was why they won no prizes. They were not powerful enough for the Speed Prize. They were not "doomed up" enough for the Consumption Prize. They were not light enough for the Altitude Prize. But in spite of that there is no doubt that for design, construction, finish, detail work, controllability and general flyableness, there was nothing at Lympne which quite reached so high an average on all points. So here was another score for one of the great pioneers of aviation, seeing that Capt. de Havilland has been flying continuously since 1909."

C. G. GREY, *Editor*, THE AEROPLANE, *Oct. 17th, 1923.*

"THERE is no doubt whatever that of all the machines at Lympne the D.H.53 was the nearest approach to a really practicable type of single-seater for all-round use. Its handiness both on the ground and in the air was astonishing for so small a machine. Actually these machines should not be regarded as competition machines at all, but rather as samples of what the owner-pilot may safely expect of a light aeroplane and also of what can be produced in the way of a light, cheap and simple training machine which is nevertheless capable of being used for quite advanced flying in even very bad weather.

There seems no reason whatever why D.H.53s fitted with camera guns should not be used for the first training of single-seat fighter pilots in gunnery and fighting tactics, for they possess the quality of rapidity of manœuvre to a degree not excelled by any actual fighter one has yet seen. In construction the D.H.53 is notable for its complete lack of frankishness. It is a simple but extremely sound example of standard British methods of construction carried out on a reduced scale."

Capt. W. H. SAYERS, *Technical Editor*, THE AEROPLANE, *Oct. 24th, 1923.*

"THE De Havilland 53 light aeroplane with 6 h.p. motor-cycle engine . . . no other country has a machine that can approach the De Havilland for general utility, strength, workmanship and manœuvrability."

THE AEROPLANE, *Oct. 31st, 1923.*

THE DE HAVILLAND AIRCRAFT CO. LTD.
STAG LANE AERODROME.
EDGWARE, MIDDLESEX.
Telegrams—"Havilland, Edgware."
Telephone—Kingsbury 160-164.

DH

Sayers might not be considered an entirely independent observer. A pioneering aircraft designer, he had penned the three Sayers-Handley Page machines entered, only one of which was present at Lympne. But he was right, and he gave credit to all those British firms who took part, contributing 16 aeroplanes of 12 distinct types. "No one of them was a freak in general design, yet no one of them was uninteresting, and among them those 16 machines have made the efforts of other nations to produce light aeroplanes look distinctly feeble. Purely and simply from a sporting point of view this result is thoroughly and entirely gratifying. But there is more to it than the sporting side for the light aeroplane presents all the technical problems of the normal aeroplane together with some of its own."

Flight was more optimistic than *The Aeroplane* about the prospects for such aircraft. "While fully realising the as yet untouched possibilities of the use by the RAF of the light 'plane, we do not think for a moment that its usefulness ends there", a post-Lympne comment piece said. "To the private owner-pilot of moderate means the type offers unlimited possibilities. Not expensive in first cost, and very cheap to operate, the light 'plane should appeal to hundreds of sportsmen at home, while in the Colonies and Dominions, where roads are none too good and railways few and far between, the light 'plane should prove a boon to land owners residing far from the nearest town". A further-sighted assessment than Grey's, certainly — and one much closer to the mark.

There was still much work to do. Straight after 1923's contest, the Duke of Sutherland confirmed a £500 prize for the winner of the 1924 edition, which would be contested by two-seat light aeroplanes. The Air Ministry promised money, too. The truly practical light aircraft for recreational and training purposes remained a little way off, and the constraints of the Lympne trials' rules arguably too rigid to further the cause of such a design. But 1923 had been a start down the right road, even if not everybody appreciated it. A





BELOW LEFT: Among the stranger designs was the Gnosspelius Gull, of which two were on the entry list. Number 19 was handled by Rex Stocken, but only briefly. KEY COLLECTION

BELOW: Alexis Maneyrol, a noted gliding pioneer, in the cockpit of the Peyret monoplane just before his fatal flight. TOPFOTO

THUNDER STRUC

A P-47D Thunderbolt finished as the wartime mount of an outstanding combat pilot, P-51C Mustang racer *Thunderbird* with records to its name — the latest projects to emerge from AirCorps Aviation wowed, and won, at Oshkosh

WORDS: CHUCK CRAVENS





For Margo Prudente and Shelly Wheeler, it was a very special moment. They are the two daughters of Maj Bill Dunham, commander of the 460th Fighter Squadron in the South-west Pacific theatre, who flew three Republic P-47 Thunderbolts named *Bonnie* after his future wife. In front of them at this summer's EAA AirVenture gathering in Oshkosh, Wisconsin was a freshly restored 'razorback' P-47D-23RA, finished as the last of those mounts.

For Warren Pietsch, the occasion was no less memorable. There was his North American P-51C Mustang racer *Thunderbird*, also newly flown, and representing the fulfilment of a lifelong ambition. As a 10-year-old boy, Warren had painted a picture of a P-51 on his bedroom wall and vowed he would some day own and fly one of his own. That dream culminated on 19 July when his journey to bring *Thunderbird* back to life was realised, and his beautiful cobalt-blue Mustang took to the skies.

These two brand-new restorations by AirCorps Aviation of Bemidji, Minnesota are unique examples of their breeds. The P-47D, restored for Bruce Eames, is the only Republic-built 'razorback' D-model flying. The other two airworthy Thunderbolts in that configuration are both P-47Gs, licence-produced by Curtiss. Warren Pietsch's Mustang tells a part of the P-51 story hitherto not represented by a flying specimen in the modern era: air racing in the early post-

ABOVE:
P-47 42-27609 displayed on its nose at Girua airport, Papua New Guinea, with a set of olive drab-painted wings from an earlier Thunderbolt in 1991 or '92. VIA CHARLES DARBY

OPPOSITE PAGE:
The two new AirCorps Aviation restorations fly in formation: P-51C Mustang *Thunderbird*, belonging to Warren Pietsch, heads the Dakota Territory Air Museum's P-47D Thunderbolt *Bonnie*. XAVIER MÉAL

RIGHT:
A major milestone was achieved with a seamless mating of the P-47's wings to the fuselage.
AIRCORPS AVIATION

MIDDLE LEFT:
The P-47 fuselage at the AirCorps restoration shop as the project began.
AIRCORPS AVIATION

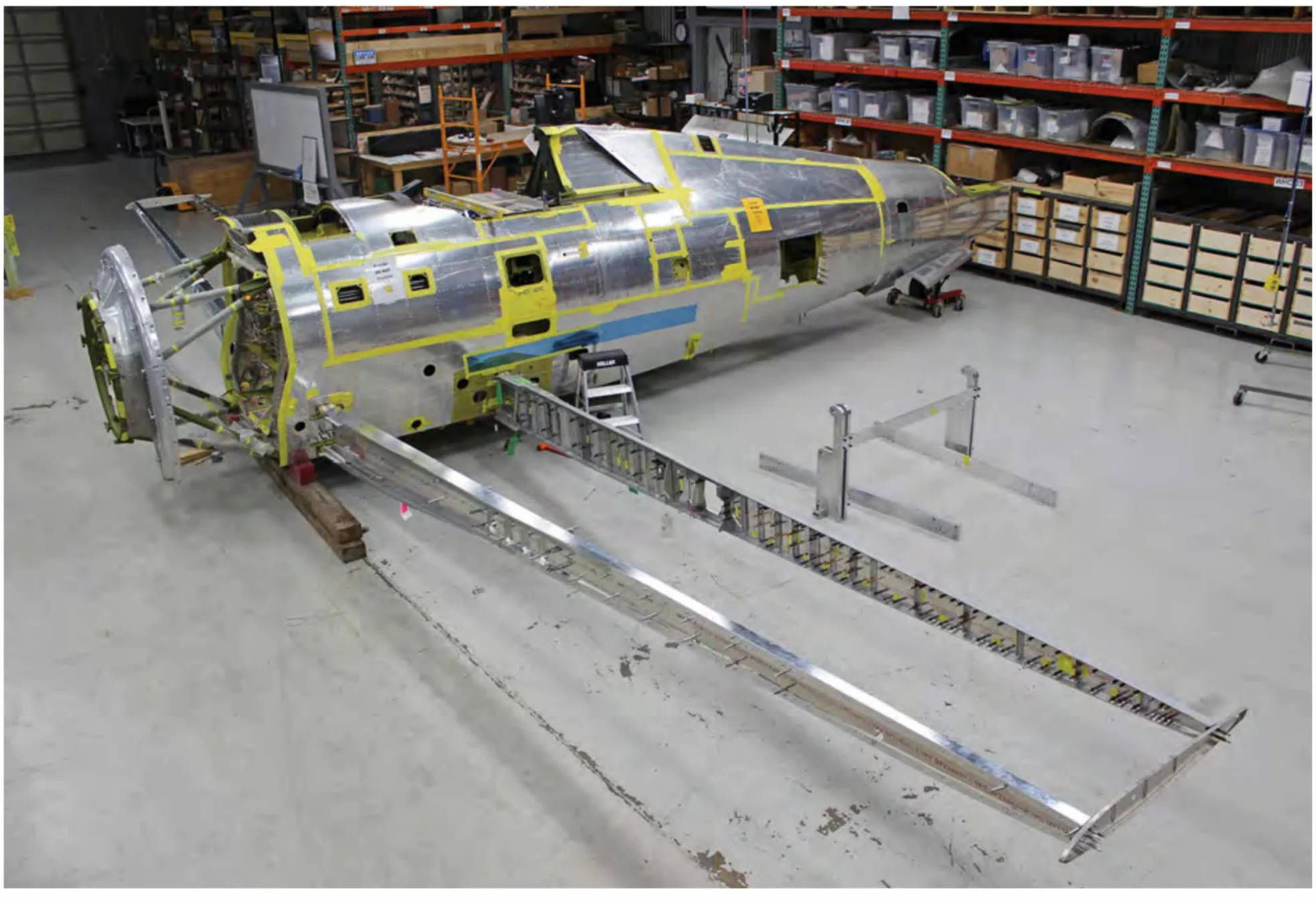
MIDDLE RIGHT:
The 'Christmas tree tank' and surrounding structure were a field modification in the South-west Pacific.
AIRCORPS AVIATION

BOTTOM:
The all-important spars fitted perfectly.
AIRCORPS AVIATION











war years. Both will be displayed and flown as part of the collection at the Dakota Territory Air Museum in Minot, North Dakota. During the AirVenture week, one or the other aircraft appeared in the afternoon flying displays, piloted by Bernie Vasquez. But how had they come to be there?

The Thunderbolt took five years of active restoration at AirCorps Aviation. Rob Greinert acquired 42-27609 in 1998 and moved it from Papua New Guinea to his facility at Historic Aircraft Restorations in Albion Park, New South Wales. It had been displayed on its nose at Girua airfield for a number of years. The Dakota Territory Air Museum bought the wreck from Greinert in March 2012. However, the P-47 had to wait in line for several other projects to be concluded, including the Dakota Territory Air Museum's Grand Champion Warbird from Oshkosh in 2018, P-51C *Lope's Hope 3rd*, and P-51D *Miss Kitty*. Having finished *Lope's Hope* in 2017, work could begin in earnest on the P-47.

Restoring 42-27609 was a daunting task indeed. After decades either in the kunai grass of tropical Papua New Guinea or on display, the P-47 had suffered both from the ravages of time and severe vandalism.

> ***"Details of the fuel tank mod were not well-documented"***

Aluminium from the wreck was valuable to people in the area as raw material for kitchen utensils, fishing lures and many other uses, so much of the skin had been removed. The turbo-supercharger had been cut from the belly to use in melting copper and brass on a local plantation.

After receiving the airframe, AirCorps Aviation immediately began ordering materials, fabricating parts, and researching 42-27609's history. A big part of getting things moving was an evaluation of what from the original airframe could be used as patterns, which parts could be returned to airworthy condition, and what needed to be fabricated. The first major assembly to be restored was the tail-cone.

As 42-27609 was disassembled, every part that had potential to be made airworthy was catalogued for testing and possible restoration. Obviously, after 54 years outside in a tropical environment, few components were usable. One important assembly that had remained relatively intact was the field modification of an additional fuel tank located behind the pilot's seat. Possessing an original example of this was critical, as the details surrounding it were not well-documented, unlike components installed in the factory.

In an interesting attempt at extending the combat radius of the Thunderbolt, a 42-gallon tank

ABOVE:
***Bonnie* was a deserving winner of the Grand Champion: World War Two award at AirVenture.**
XAVIER MÉAL



Four guns are mounted in each wing of the Thunderbolt. AIRCORPS AVIATION

was mounted behind the pilot in the turtle-deck. Due to the 'razorback' configuration of the fuselage, the tank was tapered toward the top. This shape gave it the name 'Christmas tree tank'. Scrutinising the original field-modified airframe made it possible to understand how the radios, oxygen tanks and turbo-supercharger oil tank were all moved and reinstalled to accommodate the tank. The radio racks, oxygen tank mounts and turbo-supercharger oil tank mounts used in the final restoration were all original parts from 42-27609. Many other genuine P-47 components were purchased from various sources, including some new/old stock from 1944.

Once the fuselage structure was essentially complete, the wing spars were checked for fit, a critical step that had to be carried out before assembly of the wings. The characteristic 'razorback' cockpit enclosure was next up. Since the cockpit of 42-27609 was missing, every part of the enclosure had to be fabricated from the original engineering drawings without a template. As the cockpit took shape, work on the engine mount got under way. This substantial assembly holds the 2,300lb weight of the Pratt & Whitney R-2800-59 powerplant.

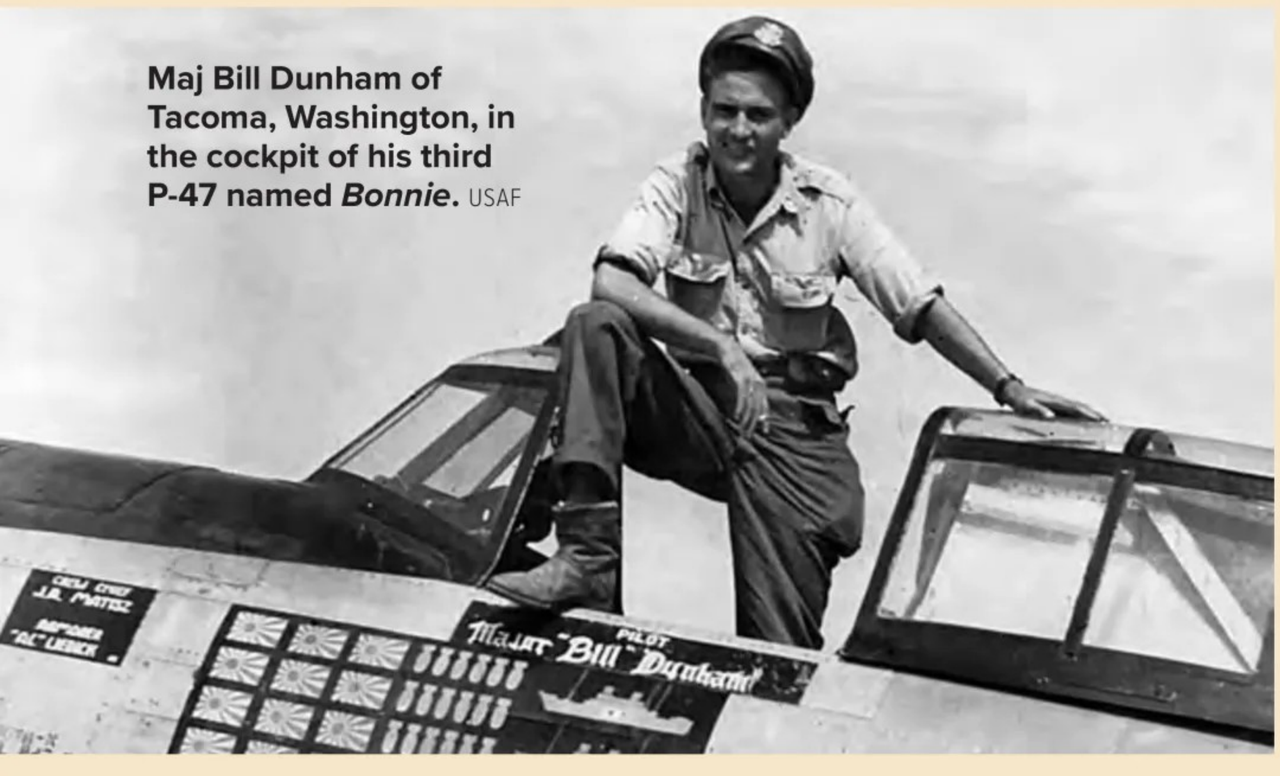
The wings received attention shortly after the tail-cone was mated to the fuselage. The wing spars were mounted in a massive fixture so assembly could begin. The P-47's semi-elliptical wing is efficient but more complex to build than a straight, tapered design like most other fighters. By the end of 2019, much of the internal wing structure had been temporarily assembled in the fixture using cleco fasteners. The fit of each wing component was confirmed, the assembly taken apart and each piece painted before reassembly and final riveting. Skinning the wings took many hours of fitting, trimming, fastening and riveting. The wings were ready for mounting to the fuselage in the spring of 2021.

The very large General Electric turbo-supercharger is one of the

"HE REVELLED IN COMBAT"

Bruce Eames, Warren Pietsch and the staff at the Dakota Territory Air Museum decided to honour Maj Bill 'Dinghy' Dunham by finishing their P-47D-23RA in the colour scheme of his aircraft when he led the 460th Fighter Squadron over the Philippines.

William D. Dunham, a small-town boy from Nezperce, Idaho, became the second-leading ace in the 348th Fighter Group and the second-leading Thunderbolt ace for all groups fighting against Japan. He scored 15 out of his 16 victories while flying P-47s. During his combat career in the South-west Pacific, Dunham — who commanded the 460th FS from 14 July-18 December 1944 — was assigned three different P-47s. All of them displayed the name *Bonnie* after his lovely girlfriend and eventual wife Bonnie Harris. He started out with an olive drab-painted P-47D-2-RE, 42-8067, from early 1943 until July 1944, followed by a P-47D-21-RE, 42-25414, from late July to late November 1944. Then Dunham was assigned his third *Bonnie*, P-47D-23-RA 42-27884. This is the colour scheme replicated on the Dakota Territory Air Museum's P-47D-23-RA. Dunham's final victory came in a P-51K-10NT named *Mrs Bonnie* after he and Bonnie had married. In his book *Check Six: A Thunderbolt Pilot's War Across the Pacific* (Casemate, 2015), James Curran noted, "The first time I saw the black trim on natural finish on a Jug it was on Bill Dunham's personal aircraft."



Maj Bill Dunham of Tacoma, Washington, in the cockpit of his third P-47 named *Bonnie*. USAF

From the stories that surround Dunham, it is clear he was a man of character, compassion and bravery. Dewitt Searles took over the role of squadron leader in January 1945, after Dunham returned to the States. In a speech about the highlights of the 460th's existence, Searles remarked, "This must of necessity be a brief history, and therefore selective. No two people in the squadron would choose to highlight the same events. But that task has fallen to me, and I would offer these as a few of the things we will all remember. First, and most importantly, the inspirational, follow-me leadership of our first commander, Maj — later Brig Gen — William D. 'Dinghy' Dunham. He came to us from the 342nd Fighter Squadron; he revelled in combat; and he led us into it with zestful enthusiasm for the first five of those 14 combat months."

Dunham was chosen to command an entirely new squadron within the 348th FG, beginning in July 1944. This unit, the 460th, was to become the famous 'Black Rams'. The squadron history report noted a positive effect on morale when he arrived, saying, "The men liked Captain Dunham immediately, were proud of his record, and accepted him as their leader."

The 14 months for which Dunham organised, trained and led the 460th FS in combat resulted in nine aerial victories





defining characteristics of the P-47's engineering philosophy. It was finished, tested, and installed on 42-27609 during the spring of 2022. The component weighs 285lb and requires a great deal of ducting between the turbo-supercharger, engine and intercooler. The ducting and turbo-supercharger itself account for the deep belly shape of the fuselage. 42-27609 is the only 'razorback' P-47 restoration to boast a functioning turbo-supercharger system. With the turbo in place, the ducting could be installed. A colour-coded diagram in the P-47 erection and maintenance manual shows the paths of the induction, exhaust and intercooler system ducts. It further illustrates whether exhaust gases, cooling air, intake air to the supercharger or compressed air to the carburettor pass through each duct.

At the same time as this was being tackled, the hydraulics, cockpit controls, electrical and fuel systems were in progress. The cockpit enclosure was fitted and the sizeable ammunition bays completed.

ABOVE LEFT TO RIGHT: The turbo-supercharger in the lower rear portion of the fuselage.

The gunsight has been fitted and the lighting tested. BOTH AIRCORPS AVIATION





ABOVE: A real highlight of the week at Oshkosh was the attendance of Bill Dunham's daughters: Margo Prudente (left) and Shelly Wheeler. They participated in presentations about *Bonnie* and saw the P-47 in their dad's colour scheme fly. AIRCORPS AVIATION **ABOVE RIGHT: Bill and Bonnie Dunham in a honeymoon photo taken in January 1945.** VIA DUNHAM FAMILY

during November 1944 and 38 more in December. During that period, while flying his third *Bonnie*, he achieved six of them. On 18 November he shot down a Mitsubishi A6M3 Model 32 'Hamp'. His 'day of days' was 7 December, when he downed four Japanese aeroplanes in one mission: two more 'Hamps' and two Nakajima Ki-43 'Oscars'.

It was during this four-kill encounter that Bill Dunham exhibited uncommon chivalry. Observing a Japanese 'Oscar' pilot descending under his parachute, Dunham pulled his P-47 around and began a run on him. It had been a common occurrence for Japanese pilots to shoot at Americans who had bailed out, so Bill's intention was probably to get a bit of revenge. However, something held him back. Instead of killing his helpless adversary, Dunham circled. Spotting the enemy pilot now bobbing in the waves with little hope of survival, he made a risky low pass, cranked his cockpit open and threw his Mae West lifejacket out to the airman. This story, told by Dunham's daughters, tells us about the character of the man the Dakota Territory Air Museum has chosen to honour.

Dunham's last victory in his third *Bonnie* was on 14 December, when he destroyed a Mitsubishi Ki-21 'Sally' bomber. Four days later, he turned over the squadron command on promotion. Dunham was reassigned to 348th FG headquarters as assistant operations officer. In early 1945, he returned to the States to participate in a gunnery school for future P-51 pilots. It was on this trip home that Bill married his long-time sweetheart, Bonnie Harris.

While Dunham had left the 460th FS, 42-27884 *Bonnie* soldiered on until the P-47 was removed from the squadron inventory in March 1945 upon transition to the P-51. It was allocated to the 58th FG and may have continued in combat, though the unit history doesn't specify serial numbers. In any case, the 58th was starting to receive later 'bubble-top' P-47s, so any combat history *Bonnie* had with it would have been brief.

Upon his return to the Philippines in May 1945, Dunham rejoined the 348th FG headquarters as its operations officer. He was promoted to lieutenant colonel that July and became the group's deputy commanding officer. By now it was flying the P-51. In his final aerial victory of the war, Dunham shot down a Nakajima Ki-84 'Frank' on a long-range fighter sweep over the Japanese home islands on 1 August.

Finishing World War Two with 16 confirmed victories and multiple decorations, he went on to a long and distinguished US Air Force career including serving as the 7th Air Force's deputy chief of staff in the early stages of the Vietnam War. Bill Dunham retired from the air force in June 1970 and died on 3 March 1990.



ABOVE: The 348th FG/460th FS markings, *Bonnie* moniker and Bill Dunham's kill symbols are faithfully reproduced. XAVIER MÉAL

A finishing touch in the cockpit was a tribute to Bonnie Harris, Bill Dunham's fiancée. A wartime photo of Bonnie was placed on the upper left quadrant of the instrument panel.

One of the most complex assemblies to fabricate on the P-47 restoration was the engine cowling. It contains a variety of compound curves that make up the characteristic egg-shaped opening, as well as several internal structures which house the oil coolers and air intake. Though the fabrication of parts had been taking place for some time, assembly of the cowl began in the spring of 2022 and continued until September.

Four different World War Two veteran P-47 pilots in addition to Bill Dunham are memorialised by the aircraft. Three of them signed *Bonnie*'s access doors, and the original pilot's handle from the wreckage of another P-47 is included in the restoration.

Maj Gen Dewitt Searles, a 24-year-old first lieutenant, led the 460th Fighter Squadron from January 1945 after the original commander Bill Dunham had left, so he had a direct connection to *Bonnie*'s squadron. Searles had a long, illustrious career after World War Two, becoming deputy inspector general of the US Air Force from 1972-74. The Dakota Territory Air Museum and AirCorps Aviation are very thankful to him for his generous co-operation in signing the access door.

> ***"While the guns can't fire, the system is otherwise functional"***

Lt Kermit Bjorlie was assigned to the 310th FS of the 58th FG in the Philippines during 1945, and he too added his name to the access door. Huie Lamb, from Abilene, Texas, flew 61 combat missions — 167 hours 40 minutes in combat with P-47s, 107 hours 50 minutes in P-51s — with the 78th FG's 82nd FS in the European theatre. He has signed the oxygen access panel.

An important detail incorporated into 42-27609's restoration is the pilot handle. This was recovered in Italy during a dig to find the remains of 1st Lt Loren Hinz and his P-47D-16RE, 42-75963, named *Gow Job*. Hinz lost his life on 25 April 1945, less than two weeks before the war ended in Europe. Using the handle from Loren's P-47 on *Bonnie* is a way to honour his sacrifice.

The ammunition and gun bays were completed with four Browning replicas and full ammunition belts. While the guns can't fire, of course, the system is otherwise functional. When the firing switch is depressed, the gun solenoids actuate.

In September 2022, the P-47 was moved from the restoration shop to the airport hangar for final assembly and engine testing. A successful test run was achieved a

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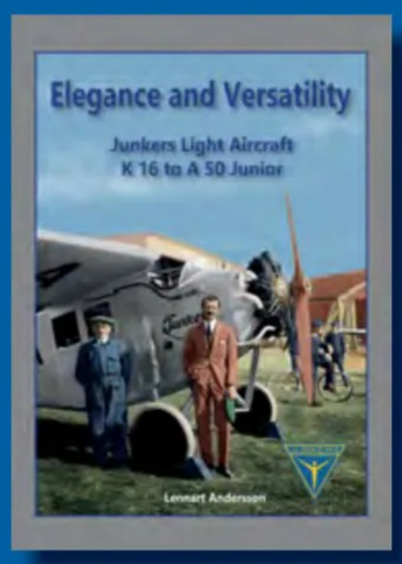
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month later. The crew from AirCorps Aviation and the Dakota Territory Air Museum anticipated a test flight in the autumn of 2022, and the Thunderbolt was ready, but delays in obtaining the necessary paperwork held it up until May 2023, when the P-47 took to the skies for the first time in 79 years.

Ten hours had to be flown in the immediate area before the Thunderbolt could go to Custom Aircraft Refinishing in Casselton, North Dakota to receive its final colour scheme. There the P-47 was expertly painted by Roy E. Kieffer and his crew. The final nose art and victory markings were applied back at AirCorps Aviation, just in time for *Bonnie*'s Oshkosh debut.

Just four days prior to landing at Oshkosh, P-51C *Thunderbird* had received its final clear coat at Custom Aircraft Refinishing. The climactic days of the project were exciting for everyone involved, and no-one more than Warren Pietsch. But he couldn't have done it alone.

His father, Al Pietsch, owned Pietsch Flying Service in Minot, North Dakota, and Warren was fortunate to grow up in the family aviation business. In the 1990s Warren took ownership of the company and renamed it Pietsch Aircraft Restoration & Repair, which would eventually become Minot Aero Center. Warren's father Al, mother Eleanor, and brothers Gary and Kent were all pilots and supported his flying career early on. Many others were encouraging, too. Gary Johnson, a mechanic and pilot who took a job with Warren's dad in 1964 and still works for Warren, Dakota Territory Air Museum chairman Don Larson, close friends Brian Sturm, Jay Blessum and many others had an impact on his aviation story.

In 1999, Warren purchased what he believed to be a damaged P-51A in Scottsbluff, Nebraska. It was only later that he found it was actually *Thunderbird*, the blue P-51C flown by Joe DeBona in the Bendix Trophy air races of the late 1940s. The discovery, and the incredible history of this Mustang, began Warren's journey to restore *Thunderbird* as a tribute to its legendary owners Jimmy Stewart, Joe DeBona, Jacqueline Cochran and James Cook.

Thunderbird looks and feels very different to any military-schemed Mustangs currently flying. It isn't









TOP: The P-51D wings and the fuselage and empennage for P-51C *Thunderbird* share the AirCorps shop with the P-47 project. AIRCORPS AVIATION

MIDDLE LEFT: The skin section just outboard of the undercarriage would have contained gun ports on a front-line Mustang. AIRCORPS AVIATION

MIDDLE RIGHT: Normally P-51s have holes in the shiny skin section shown here, which allowed outside air to flow through the air filters and onto the carburettor during ground operations. AIRCORPS AVIATION

ABOVE: 42-27609 runs its Pratt & Whitney R-2800 for the first time. AIRCORPS AVIATION

THUNDERBIRD AND *MR ALEX*



Jimmy Stewart (right), Joe DeBona (in cockpit) and crew members with *Thunderbird* during 1949. ALAMY

Thunderbird is one of the most recognisable Mustangs from the post-war era. The P-51C, NX5528N, most notably won the 1949 Bendix Trophy, piloted by Joe DeBona, and set a piston-driven race speed record of 470mph which still stands today. It was owned by actor Jimmy Stewart, who had served as a B-24 pilot during World War Two and was an air force reservist at the time he was the P-51's custodian.

The aircraft has no known Army Air Forces serial number, and was built using parts from three different airframes. Leland and Martha Cameron bought them through their business, Allied Aircraft of Chicago, Illinois, in 1948. *Thunderbird*'s Civil Aviation Administration file states, "This aircraft was assembled from components of other aircraft of the same type". It is designated on the CAA form as a P-51C, serial 2925. This appears to be a made-up number, because it does not conform to any North American Aviation or US Army Air Forces serial sequences for P-51s.

Before issuing the registration to Cameron in 1948, the CAA questioned the bill of sale to Allied Aircraft that was dated 11 February of that year. According to a research summary of the CAA files by photographer and historian Malcolm Gougan, Cameron sent a letter of clarification to the CAA stating that the parts for the aircraft were purchased from the War Assets Administration, WAA Agents, the US Army or US Navy, the Wunderlich Contracting Company, and Sharp and Fellows. The Wunderlich Contracting Company had bought all the surplus aeroplanes stored at Kingman Army Air Field in Arizona, Martin Wunderlich paying $2,780 for 5,483 aircraft. Cameron attached an invoice for the fuselage.

Much later, as he researched a book he co-wrote, *Military Aircraft Boneyards* (MBI Publishing, 2000), Kevin Grantham had the opportunity to speak to Leland Cameron about building up the aeroplane. Cameron confirmed that the fuselage of *Thunderbird* had in fact come from Kingman.

In the months after the sale from Cameron to Jimmy Stewart, owner of the Joe DeBona Racing Company, *Thunderbird* was prepared for the upcoming 1948 Bendix Trophy. Unnecessary equipment such as the self-sealing fuel cells, the fuselage fuel tank and much more was removed to save weight. Streamlining efforts like installing fairings over the gun ports, and filling the airframe seams with putty and sanding them smooth, were intended to increase speed. An experimental high-speed propeller tested by North American was acquired and fitted to *Thunderbird*.

It was finished with 48 coats of primers and paint, a beautiful glossy cobalt blue. Polished to a high shine, the livery reportedly added 8mph to the speed of the aircraft. DeBona entered the 1948 Bendix race but dropped out en route, landing at Norwalk, Ohio, low on fuel. It must have been a great disappointment to have to land just 63 miles short of the finish line at Cleveland.

1949 was to be different, however. At precisely 06.30hrs on 3 September, the flags dropped and six air racers released their brakes. Alkali dust swirled from the bed of Rosamond Dry Lake in the Mojave Desert as three P-51s, a Martin B-26C Marauder and a de Havilland Mosquito Mk25 built up speed for take-off. Joe DeBona climbed to an altitude with favourable tailwinds and streaked toward Cleveland. As he checked off the position for each course correction, he felt more and more confident that this was the year he'd eventually win the Bendix. Four hours 16 minutes and 17.5 seconds later, *Thunderbird* flashed past the tower at Cleveland in first place. The official over-land speed for the course was 470.135mph.

In the wake of that triumph, in December 1949 Jimmy Stewart sold *Thunderbird* to Jacqueline Cochran of Indio, California, for "$1.00 and other consideration". She went on to set three world speed records with the aircraft. Cochran had owned *Thunderbird* for just over three years when, on 20 January 1953, she sold it back to Stewart under the same terms.

Six months later the P-51 took part in a ground-breaking television event: the coronation of Queen Elizabeth II on 2 June 1953. It was the biggest challenge the North American TV industry had faced. While it was theoretically possible to transmit directly across the Atlantic through underwater cables, it would require the use of every existing cable, at the prohibitive cost of $40 million.

Since videotape and satellites didn't exist in 1953, the only viable option American and Canadian stations had was to physically transport film of the coronation to broadcasting facilities within the US. Then as now, the networks vied to be first, and this competition evolved into the 'Great Coronation Race'.

The Canadian Broadcasting Company (CBC) arranged for the BBC's kinescope film to be flown from London to Goose Bay, Labrador in an RAF Canberra. CBS and NBC managed to obtain space in the same Canberra for their separately made films. The CBC footage would be transferred from the Canberra to a Royal Canadian Air Force jet for delivery to Montreal and subsequent broadcast, but the two US networks needed a way to get the kinescope film from Goose Bay to their broadcasting facilities in Boston, Massachusetts, the closest



F-6C 44-10911, photographed in storage at Kingman Field, is believed to be the Mustang which had its fuselage used in the original build of *Thunderbird*. WILLIAM T. LARKINS VIA A. KEVIN GRANTHAM



With DeBona at the controls, the Mustang gets airborne for a record flight attempt from Burbank to New York on 9 April 1953. While the aeroplane sports the colour scheme carried when it was known as *Mr Alex*, the name does not appear to have been applied. GETTY

transmission point with the ability to feed the entire country for both stations.

This is where *Thunderbird*, now repainted and named *Mr Alex* after Alexander Maitland Stewart, Jimmy Stewart's father, entered the story. Stewart just happened to own an interest in a CBS affiliate TV station, and CBS duly hired Joe DeBona to fly his P-51. NBC opted to use arch-rival Paul Mantz's red P-51, flown by Stan Reaver, who had finished second to DeBona in the 1949 Bendix Trophy and vowed not to let that happen again. The plan was that both DeBona and Reaver would pick up the coronation film from the Canberra at Goose Bay and race to carry it to Boston.

The British jet made the crossing and was on the ramp in Goose Bay with the film by 13.45hrs eastern time on 2 June. DeBona and Reaver rushed to get the reels and stow them in their respective aircraft. Leaving at 14.02, DeBona arrived in Boston at 16.13. Reaver departed at 14.15, had icing problems, and reached Boston at 16.37.

When the realisation dawned that CBS's DeBona in *Mr Alex* would make it first, an NBC executive approached ABC's management with a new solution. ABC had struck a deal with CBC for access to its coverage, and NBC was now willing to pay any amount so it could share the broadcast. An arrangement was reached, and just moments before 16.00 — less than 15 minutes before DeBona landed in Boston — both NBC and ABC switched their feed to CBC's coverage from Ottawa.

As DeBona covered the last few miles to Boston's Logan Airport carrying the CBS film, NBC executives were dismayed to see CBC broadcasting the Canadian celebrations, instead of events from London. At 16.17, CBC switched to the Montreal feed that showed the London coverage. This meant both NBC and ABC were able to beat the CBS coverage by several minutes, without needing the film brought by Reaver a mere 20 minutes later. CBS went on the air with its own coverage at 16.23 and could claim to be the only network to have run an edited version it produced itself. The race had, nonetheless, done a great deal to promote television by enabling the same-day broadcast of a distant world event.

Mr Alex became a record-breaker again on 31 March 1954, when DeBona flew it from Los Angeles International Airport to New York's Idlewild Airport in four hours 24 minutes and 17 seconds, a speed of 560.74mph. Jimmy Stewart sold N5528N to its regular pilot on 1 September 1954. In turn, James M. Cook of Jacksboro, Texas purchased the aeroplane from DeBona on 16 March 1955. Cook installed silver iodide burners on the aircraft for use in suppressing hailstorms over western Nebraska. He had earlier used a Curtiss P-40, which was damaged in August 1954, necessitating the acquisition of another suitable platform.

On 15 August 1955, however, N5528N's first flying career came to an end. Contemporary news accounts quote James Cook as saying, "one wheel is locked in the up position and one is locked down". Cook struggled to get the undercarriage problem corrected for an hour and 40 minutes, but couldn't rectify it despite advice over the radio from several P-51 experts. He survived by bailing out successfully.

meant to be a 'time capsule' aircraft with every detail and rivet precisely faithful to the original. Instead, it honours its predecessor by telling the *Thunderbird* story, and showing the public what the machine looked like when it participated in the 1949 Bendix Trophy.

To achieve this, an aeroplane had to be resurrected from the wreckage recovered in 1999. Warren collected parts and information for more than 20 years until he entrusted AirCorps Aviation with the project. *Thunderbird* arrived as a fuselage, empennage and a set of wings. The airframe was largely structurally intact but still needed systems, firewall-forward installation, wiring, and final paint and finishing. This was done to AirCorps' world-class standards. Thanks to the items Warren had collected, the timeline for *Thunderbird* was much shorter than a typical warbird restoration.

After the components Warren had collected arrived at the AirCorps Aviation hangar in Bemidji, the major assemblies were test-fitted

> ***"Warren Pietsch collected parts and details for more than 20 years"***

together. Everything went well, so the project was moved to the nearby restoration shop. *Thunderbird* shared shop floor space with *Bonnie*, the P-47, as it underwent systems work and assembly.

The knowledgeable and observant will notice the wing and some of the lower engine cowling chosen for this project are from a P-51D. The decision to use the D-model wing was ultimately made by Warren. With many flight hours logged in a variety of P-51s, he appreciated the safety and handling qualities of the D-model wing over the C-model. The later P-51D wing boasts a robust undercarriage and landing gear door systems. The B/C wing's clamshell doors were lighter and had a single up-lock, while the D's gear doors had multiple locks that made cycling the undercarriage more reliable. Additionally, there had been documented instances of the B/C doors tearing off in high-speed dives, so North American re-engineered





TOP:
Thunderbird had a very successful maiden test flight.
BEN REDMAN

ABOVE:
All the thoroughly researched markings were located and photographed so they could be masked and painted after the blue colour was applied.
AIRCORPS AVIATION

an updated system for the D-model. The later wing also has stronger and more effective ailerons. A seal added to the leading edge of the ailerons reduced stick pressure during hard manoeuvring.

The early-model clamshell doors on the original *Thunderbird* may have been what caused the aircraft to crash in June 1955 when they closed out of sequence and jammed the main landing gear. The owner at the time, James Cook, elected to bail out rather than risk a fiery landing in the wet-winged Mustang with the undercarriage jammed.

Fortunately for the restoration crew at AirCorps Aviation, fitting a D wing on a B/C Mustang fuselage had been pioneered and documented by North American Aviation during World War Two. It was an idea that was built and tested, but never produced. The documented existence of this factory-tested prototype made obtaining major alterations approval from the FAA much easier.

Because *Thunderbird* was an air racer, many of the military systems were removed to reduce the overall weight and increase its speed. The guns were taken out, and the leading-edge skins altered to cover the gun ports. Another altered skin section was the area where air is drawn through air filters when on the ground. The air filter box and filters were among the items removed, and the perforated skin section was replaced with a smooth section for streamlining. All these modifications were included in the restoration.

> ***“Fitting a D wing on a B/C fuselage was done by North American”***

An area where no changes were necessary was the cockpit enclosure. Forms were fabricated and used to make the cockpit enclosure bows. The framed canopy is one of the distinguishing characteristics of Mustangs built



ABOVE:
A spectacle not seen in the skies since 1955, when P-51 N5528N crashed.
XAVIER MÉAL

before the D-model 'bubble' version was introduced.

Getting the structural elements of the cockpit and enclosure out of the way, it was time to install the electrical system, flight controls and hydraulic system controls in the cockpit and wheel wells. Systems work is long-winded because much of it involves confined spaces, and each circuit and system has to be tested as you go along. The cooling system was also completed in the spring of 2023.

Wing and empennage fillets, control surfaces and the scoop assembly followed the cooling system installation, and were the last tasks on the restoration shop floor. With these items checked off the list, the P-51C was moved out to the AirCorps Aviation hangar at Bemidji Regional Airport for final assembly. The P-51 received its Packard Merlin engine almost concurrently with the P-47's first flight.

On 25 May 2023, AirCorps employees gathered at the hangar to celebrate *Thunderbird*'s first engine run, which went smoothly. Finally, after ground-running and the checking and rechecking of all systems, *Thunderbird* made its maiden post-restoration flight on 6 June. Over the course of the next few days, the town of Bemidji was treated to the sight and sound of two Mustangs as *Miss Kitty* flew chase with *Thunderbird* to attain the required flight hours before the P-51C was moved to Custom Aircraft Refinishing in Casselton for its very special paint job. All the thoroughly researched markings were located and photographed so they could be masked and painted after the blue colour was applied. The final touch to replicate the 1949 appearance of *Thunderbird* was the addition of the polished propeller.

At Oshkosh, the new restorations from AirCorps both featured among the winners. The P-47 took home the Grand Champion: World War Two prize and the Phoenix Award, while the P-51 was the recipient of a Keep 'em Flying Award. Visitors from the world over examined the aircraft with great admiration. And the pride felt in particular by Margo Prudente, Shelly Wheeler and Warren Pietsch made it all especially worthwhile. A

SHORT SELLING

Go along for the ride with a Short Sealand amphibian on a 1950 sales tour of Europe and North Africa that didn't always proceed quite according to plan... **WORDS:** JOHN CORLETT



The announcement in 1949 by Belfast-based Short Brothers & Harland of plans to produce a twin-engined amphibian, with two DH Gipsy Queen 70-3 engines, to be operated by a crew of two and capable of carrying five to seven passengers and their baggage over short-haul and medium-distance routes aroused wide interest throughout the aviation world. Appropriately named Sealand, a vigorous sales drive was promoted, beginning with a tour of interested countries in Europe and extending to North Africa.

The aircraft selected was the second of a batch of four pre-production machines. Registered G-AKLO, it was finished in an attractive scheme of light blue superimposed on dark blue. Seating and general layout was as per a standard production aircraft, the only small divergence being a minor modification in the cockpit area.

With recollections of Imperial Airways airliners arriving at various airports with two flags — the Union flag and the Royal Mail ensign — gaily fluttering from twin masts above the cockpit, a suggestion had been approved that, in similar fashion, compliments might be paid to host countries by flying their national flag together with the British flag. So it came about that two short retractable masts were provided and an order placed with a London firm for the supply of the relevant international flags.

On 5 May 1950, G-AKLO left Belfast on the start of a sales tour visiting France, Spain, French and Spanish Morocco, the Canary Islands, Portugal, Italy and the Netherlands. On board were three members of the staff of Short Brothers & Harland: Gordon, who had previously been flying amphibians in the Bahamas and had recently joined as a sales demonstration pilot; Neville, of the sales department, with previous workshop experience as a shop-floor supervisor; and the author who, on this occasion, wore three hats, namely engineer, photographer and tour manager.

In the latter capacity it had been necessary to correspond with the company's agents in several capitals to arrange a timetable. The considerable labours and ensuing voluminous correspondence could well have been spared. As the tour progressed a number of prospective demonstration flights were cancelled or alternatives requested. To moderate the undesirability of taking the aircraft out of service to perform routine maintenance, a system of progressive maintenance was employed — there was generally some spare time in the evenings. Rest days somehow never materialised.



ABOVE:
The crew meets Sir Kenneth and Lady Anderson in Gibraltar.

> ***"Many people pointed at the flags, some jumping from their seats"***

The completion of formalities and customs clearance kept G-AKLO on the ground at Northolt until 17.25hrs and an overnight stop was made at Rennes. The planned early departure the following morning was frustrated by currency complications, and it was gone 11.00 before the wheels lifted off the cratered runway. A stop was made at Bordeaux for the purpose of refuelling aircraft and crew. Although anxious to press on to Bilbao to keep an appointment with the company's Spanish agent, it was mutually agreed that the early, rather unsatisfying Continental breakfast needed supplementing in the expectation of being heavily involved in demonstrations and sales talk from the time of arrival. A wise decision, as it turned out, though the heavy involvement did not concern Sealand sales.

It was Saturday afternoon when we arrived, and there were crowds in the spectator area watching with interest the comings and goings at this busy airport. Taxiing past with the British and Spanish flags streaming from the masts it was apparent that great interest had been aroused. Many people were observed pointing at the flags, some even jumping from their seats.

Awaiting us was the Spanish agent, recognised from a photograph. Opening the door of the aircraft as the engines were switched off, I prepared to introduce myself: "Señor Escario"... He ignored the outstretched hand. "The flag", he exclaimed excitedly — "quickly

OPPOSITE PAGE:
Acting as the type's European-market demonstrator, Short SA6 Sealand G-AKLO visited several countries before a mishap in France. It was sold to Malaya as VR-SDS and operated by the British Malayan Petroleum Company, owned by Shell.
ALL VIA JOHN CORLETT



ABOVE:
In the shadow of the Rock, about to be replenished by a Shell tanker.

remove it. It is the old royalist flag and the people are very angry!"

Neville, who had been about to follow me out, overheard, made a beeline for the cockpit and promptly struck both flags. The agent, following hotly behind, snatched the offending piece of bunting and we never saw it again. We exited from the aircraft and I tried again, but I was interrupted by the arrival of a jeep. The driver addressed us in Spanish and our agent interpreted: "We are all to accompany this man to the office of the airport commandant". I insisted on closing cockpit windows and locking the aircraft door while Escario fussed: "He is very important man, we must not keep him waiting."

In the commandant's office we were harangued in Spanish. We hadn't a clue what was being said, but it was pretty obvious he was not pleased. Escario, now perspiring profusely, was obviously making excuses on our behalf and occasionally breaking into English, generally to convey an instruction like "please produce your passports", which the commandant briefly scanned and then swept into a drawer of his desk, an action we didn't altogether care for.

After some 20 minutes the commandant appeared to be somewhat mollified, and convinced that ignorance rather than impertinence was responsible for us displaying the wrong flag. Passports were returned, and we were about to be released with smiles and handshakes all round when the door burst open and an imposingly uniformed figure followed by two khaki-clad subordinates wearing the distinctive black patent-leather headgear of the Guardia Civil stormed in — the chief of police from Bilbao, summoned, it would appear, by some over-zealous citizen. Explanations were again requested and given; passports were demanded, scrutinised and impounded.

After a prolonged dissertation and when it had been re-established that in so brazenly flaunting the royalist flag, no insult, implied or intended, had been imposed on the populace — and more importantly 'El Caudillo', Generalissimo Francisco Franco, whose coloured portrait appeared to gaze with stern disapproval from behind the commandant's chair, now occupied by the chief of police — sheets of paper were called for. The three English miscreants wrote their full names and addresses, their fathers' full names and addresses and occupations, their employer's name and address, their positions within the company, the purpose of their visit to Spain, and much more of apparent irrelevance. The statements were signed, witnessed, rubber-stamped and locked in a safe. Finally, and somewhat grudgingly, our passports were given back to us and it was indicated that the interview was concluded. No friendly handshakes were offered, and we were escorted back to the aeroplane by the Guardia Civil.

> ***"We found that the runway was a stretch of sand bound with oil"***

Where were the interested parties to whom we were expecting to demonstrate the aircraft's capabilities, I inquired of the agent? He proceeded to explain that we would meet them tomorrow at San Sebastián, whither he was now proposing to take us by car, but first we must have a cooling beer after the tensions and the talking of the last one-and-a-half hours.

When we got on the road he explained that during the summer months many families moved from Madrid, where it can be uncomfortably hot, to the coast — principally San Sebastián in the north of the country, leaving husbands and fathers to commute backwards and forwards at weekends, a trying 12-hour train journey. Now a consortium of businessmen had ideas to operate a summer service with Sealand amphibians from Madrid airport to the harbour of Fuenterrabia, a mere stone's throw from San Sebastián and a one-and-a-quarter-hour journey by air. Tonight, over dinner, he continued, we should discuss details of the project with the principals involved, and tomorrow we would inspect the harbour at Fuenterrabia with a view to bringing the aircraft there and returning with the directors to Madrid.

Sunday morning's visit to Fuenterrabia disclosed a good-sized harbour and an open-mouthed bay. In the harbourmaster's launch we were taken out to inspect the approaches and all seemed satisfactory, except for the discovery that there was a differential of something in excess of 3m between high and low water. It was arranged that he would forward to our agent in Madrid a copy of the tide table for the current month, and when notified of the date of the forthcoming demonstration flight would have an area cleared of boats and buoys.

Earlier it had been agreed that Señor Escario would accompany us

from Bilbao to Tenerife, where an important project to provide an air link between some of the islands in the Canaries group awaited demonstration of the Sealand's capabilities. We returned from San Sebastián to Bilbao by road and from there flew to Madrid.

As some eleventh-hour interest had been expressed regarding Sealand operations by a company in Seville, Escario requested a landing there. From the airport he telephoned the offices of the concern, but it transpired it was not sufficiently far advanced in either planning or finance to enter into detailed discussions, so we proceeded on to Gibraltar and checked into the Rock Hotel.

At Gibraltar we were honoured with an informal visit by the governor-general, Sir Kenneth Anderson, who — together with Lady Anderson — was shown over the aircraft. They both expressed interest and remarked on the comfortable seats and the excellent view from the large, well-placed windows, but a subsequent pre-arranged demonstration and discussion with a potential customer was cancelled. Instead, the opportunity was taken to do some maintenance work, while a later check flight was combined with a positioning sortie of about 30 minutes which saw the aircraft being taken out of Europe and across the straits to North Africa, making an overnight stop at Tangier.

From this point the planned route was more or less parallel to the coastline with a refuelling halt at Casablanca, a night stop at Agadir and a further refuelling at Cabo Juby on the coast, before striking off across the sea for the one-and-three-quarter-hour flight to Tenerife where our ETA was 14.30 on Saturday.

Cabo Juby from the air did not look at all like an international airport, which in fact it wasn't. Startlingly white buildings contrasted with the interminable sand. It proved to be an outpost of the Spanish Air Force, complete with married quarters, and a staging point of the airline Iberia operating a through route from Madrid to Las Palmas with Junkers Ju 52/3ms. After some initial puzzlement we finally established that the runway was a stretch of sand bound with oil, impacted with a heavy roller and delineated by a series of white-painted barrels.

We began to lose height, and after radioing the tower for landing clearance Gordon called for one-third flap, and shortly after, "Undercart". Having moved the actuating lever to 'down' and prepared to confirm the usual 'three greens', it was with surprise that I observed only the two outer green lamps in the cockpit indicator illuminated, confirming the main legs were down and locked, but the tailwheel indicator remained persistently red, meaning it was locked in the retracted position.

The Sealand's tailwheel did not actually retract, but rotated through 180° when it was raised above the waterline. It was impossible to observe the tailwheel from any position inside the aircraft. Gordon, having noted the indications, had already applied more power to overcome the extra drag of the lowered undercarriage legs and to maintain height. He nodded affirmation to my suggestion, "Clean up and try again?" When three reds were showing, Gordon firmly moved the actuating lever to 'down'. We got the same indication as before: two greens and a red. He called flying control and told them we had a temporary hang-up in our undercarriage system, requesting permission to continue circuiting while we sorted it out. By now both Neville and Escario were aware we were having trouble and were standing by the cockpit door. A



ABOVE:
Inspecting the recalcitrant tailwheel at Cabo Juby.

BELOW:
Moored-up during one of the tour stops. The Sealand was a competent aircraft, but not the greatest performer, and just 25 ended up being built.





Interested onlookers inspect the unusual machine in Morocco.



Several of the airfields visited by G-AKLO were in less-than-outstanding condition, but it coped well.



Emerging from the water at Marseille-Marignane.

brief discussion agreed the next step was to rely on the emergency system. This employed a compressed air bottle, which released its contents directly into the undercarriage lines, and the direct application of higher-pressure air caused the immediate actuation of the three units.

Well, that was the theory. There was an encouraging noise from the sudden release of compressed air, and the two legs came down very smartly, but the red tailwheel light never extinguished. "Perhaps it's a spurious indication", I said hopefully, and agreed to go aft to see if something could be sorted out. The freight hold was filled to near-capacity with boxes of spares, tools, packs of sales brochures and several cases of personal luggage. Neville helped remove sufficient items to give access to the tailwheel attachment area, but there was very little to be seen and absolutely nothing to indicate the position of the wheel.

Back in the cockpit after once more raising the mainwheels, there was further discussion of our remaining alternatives. It was obvious to all that a landing even on the firmed sand of the 'runway' without the benefit of proper support at the aft end — no matter how gently it was accomplished — must inevitably result in damage and frame distortion, which would be difficult and time-consuming to repair. The only option was alighting on the sea, fortuitously near at hand. We made a couple of low passes, with no evidence of submerged rocks or shallows. Flying control was notified of the decision, and having spent 55 minutes orbiting a smooth touchdown on the calm offshore water induced a general feeling of relief.

When we first approached Cabo Juby there had been very little sign of any activity on the ground, but the continued circling had evidently disturbed quite a few from their siesta and a good many people were now hastening towards the beach to witness the novelty of an aircraft, previously in obvious difficulties, taxiing confidently towards the shore. A large rowing boat manned by half-a-dozen turban-wearing figures came out to meet us.

Gordon 'chopped' the engines and lowered the undercarriage, the accepted method of 'taking off way', or killing forward speed when

approaching moorings. Opening the sliding side window, a hinged drop-down door enabled me to step onto a narrow external platform which gave access to a mooring hatch in the bow. One of the men in the boat threw a rope and, waiting until I had made a hitch around the mooring bollard, lifted a huge stone from the bottom of the boat, to which the other end of the rope had been tied, and dropped it overboard. Moving around to the entrance door which Neville had already opened, they helped each of us in turn into the boat.

I asked Escario to tell them to take us aft to examine the tailwheel. As they manoeuvred the boat into position a preliminary assessment established there were no obvious signs of damage. Nor, as far as I could see, had anything become disconnected. Returning to the entrance door, a quick check in the cockpit confirmed the undercarriage position indicator was now showing 'three greens.'

Ferried ashore just as the commandant arrived in a jeep, introductions established that he and Escario were acquainted from earlier days and we were taken to the officers' mess for some refreshment. A telephone call to flying control requested them to notify their colleagues at Los Rodeos, Tenerife airport, that we were temporarily delayed and it would be appreciated if they would advise Señor 'so-and-so' and party who were awaiting our arrival.

It was learned that the only way to get the aircraft to the runway area for refuelling and facilities to inspect the tailwheel mechanism was to fly it in, so an immediate adjournment was made to the beach. While it was being cleared of spectators, Gordon was rowed out to the Sealand where he released the mooring rope and gave it back to the boatman. He started the engines and taxied up onto the beach. We transferred spares, tools, luggage and so forth from the freight hold to the jeep which the commandant had kindly put at our disposal. Gordon took off, solo, from the sand and landed a few moments later on the other side of the line of buildings which fringed the beach.

With the tail jacked to lift the wheel just clear of the sand, it was possible to disconnect the mechanism and rotate it by hand. Close inspection failed to reveal any obvious cause for malfunction,



LEFT:
Refuelling being performed from drums.

so it was concluded that newness plus insufficient lubrication during assembly were probable contributory factors to temporary seizure induced by different rates of expansion between dissimilar metals as the structure heated up while flying over the desert. This was supported by the fact that, when the structure was cooled after part-immersion in the sea, the application of light hand pressure caused the assembly to operate as designed. A mixture of oil and grease was forced into the watertight gland and all moveable parts of the assembly

> ***"A long, oily swell gave us an uncomfortable switchback ride"***

were generously lubricated. A full retraction functioning test should have followed, but the lack of facilities to safely jack-up the aircraft compelled abandonment.

Our late arrival in Tenerife did not in any way detract from the enthusiasm of the consortium planning to open an inter-island amphibious air service with Sealands. Thus on Sunday morning at Los Rodeos we embarked six passengers, Neville having volunteered to stay behind so a second wife could accompany her husband. Take-off was at 11.50 for the one-hour flight to the island of Santa Cruz de la Palma. The water looked calm as we circled the harbour and throttled back for the approach, but as we alighted on the open sea it was at once apparent that there was a long, oily swell which gave us an uncomfortable switchback ride and prompted some passengers to express relief as we taxied into the sheltered waters of the harbour.

It was the first time many of the islanders had seen an aeroplane at close quarters, and crowds were already flocking to the harbour as we made fast to a buoy and a boat came alongside to convey us to the pier. The local boatmen had a busy and profitable afternoon, a seemingly endless queue waiting for a five-minute circuit of the harbour and a close-up of 'el aeroplano.'

Luncheon, on a pleasant hotel balcony overlooking the harbour, was largely occupied with discussions on finance and other matters concerning commercial operation of the aircraft. This was really Neville's field, but Gordon and I did our best to supply the answers. Engines were started for the return flight to Tenerife at 16.20. Gordon asked me to hold us on the buoy as long as possible while he built up revs, but we soon began to drag the buoy, and I had to slip moorings and get back into the cockpit a bit sharpish. I had, in fact, just got into my seat — door and window

closed — when we reached the end of the harbour wall, and it felt as if someone had suddenly put on the brakes as we ran full-tilt into the middle of a rising wave. We 'shipped it green' over the top of the wing, slid down into the trough, rose up on the next wave and were left momentarily airborne, but, lacking enough flying speed, fell back onto the water with a juddering thud and a mighty splash.

Gordon was fully occupied with holding the wing level and the aircraft bow-on to the waves while I held the throttles wide-open and hard against the stops. Once more an ascending wave carried us upwards and left us still lacking those few extra knots needed to keep us airborne, so we dropped back onto the sea, but on the next cycle Gordon was able to hold off and gain speed sufficient to enable us to climb away. A moment earlier I had glanced back into the cabin to see how our passengers were reacting to the situation, and noticed the two men in the front seats were holding not their breath but their watches, timing the take-off. A quite unnecessary exercise, as the day's events had proved the impossibility of operating Sealands with fare-paying passengers under such conditions.

Subsequent inspection of the aircraft revealed it had withstood the severe poundings experienced without any damage. The only slight abnormality to be observed was, in workshop parlance, some 'quilting' of the planing bottom, meaning a slight concavity of the duralumin skin sheeting between rivet lines.

After a day devoted to maintenance and some cleaning-up, we flew to Las Palmas where another demonstration of the amphibious capability of the Sealand had been asked for. This time take-off was from the airport, Gando, to Puerto de la Luz where an alighting was made on the smooth waters of the almost enclosed harbour. A further day was devoted mostly to technical and performance discussions with interested parties, following which we set off to retrace our route to Tangier and thence to Lisbon. Here we met Shorts' Portuguese agents and, over a week, fulfilled a busy programme of demonstration flights and discussions. Alightings and take-offs were made from the River Tagus. Then, once again, it was over the Sierras and back to Madrid to demonstrate the aircraft to some military authorities, and to fulfil the earlier promise of bringing the Sealand to Fuenterrabia.

> ***"An ascending wave left us lacking the knots to keep us airborne"***

Back in the company of Señor Escario, we flew to Bilbao where Neville agreed to remain behind as we embarked five members of San Sebastián council, and, after circling their town, we made a couple of low passes over Fuenterrabia harbour, alighting on the high tide a few minutes before 13.00. It seemed as if the whole place had turned out for the occasion, the numbers greatly swelled by schoolchildren who had been released from their studies to take part in this momentous welcome to a project so full of promise of bringing added prosperity.

It was some four hours later that the crew and party of VIPs again boarded the launch, which, in convoy with another carrying pressmen and photographers, set out to where the Sealand rode at a buoy. Gordon and I had some misgivings, as our progress was momentarily arrested each time the keel sliced through the top of a sandbank, and we were not reassured by the sight of the Sealand reposing at an unusual angle. We were soon to discover this was due to the tide having gone out and one wheel of the undercarriage, which had been lowered for its braking effect as we approached the buoy, was resting on a sandbank.

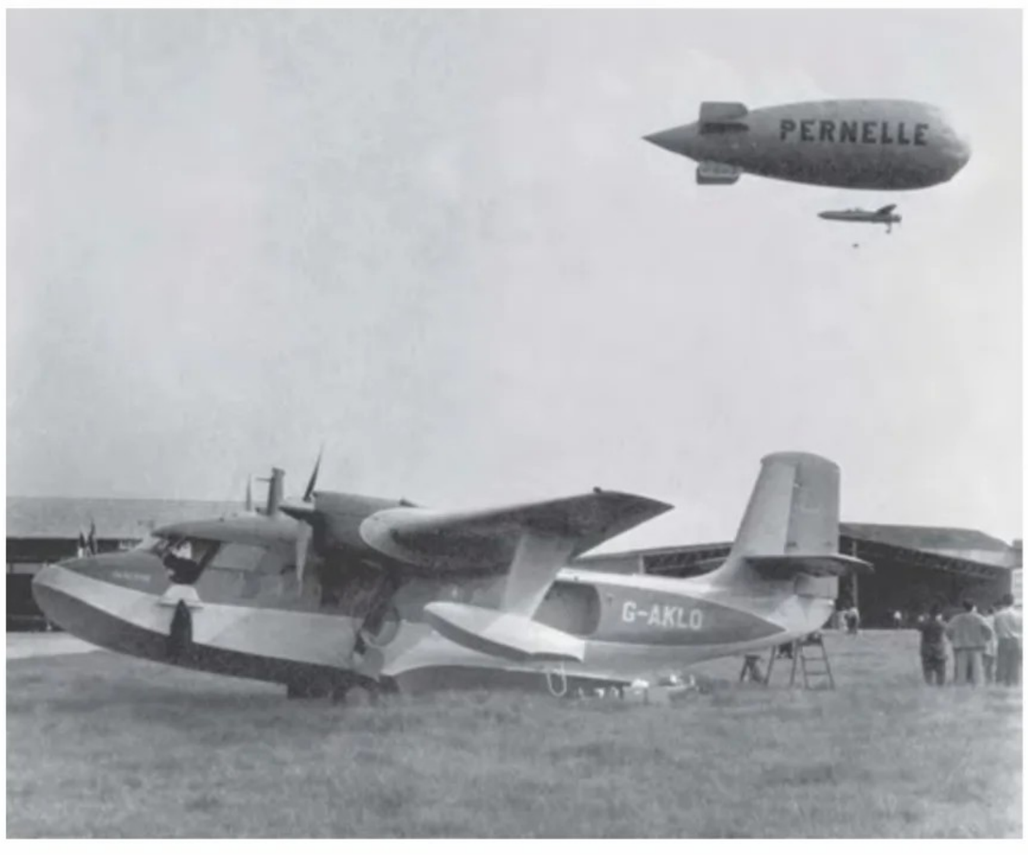
There was no alternative but to cancel the flight, explaining to our passengers the impossibility of even taxiing the aircraft without sufficient depth of water under the keel. We departed without any passengers or accompanying pressmen, and with only a handful of spectators to witness it, on the full tide next day.

Our French agent at Marseille had a very full programme arranged. Numerous demonstration flights took place from Marignane airport, the presence of a convenient slipway enabling the Sealand to be taxied from the runway into the water, and vice versa.

En route to Milan, an overnight stop was made at Albenga, a small airfield in the Maritime Alps. It turned out to be the flight test centre for the Piaggio company, at that time producing a twin-engined amphibian, the P136, comparable in size and seating capacity to the Sealand. It appeared the former was about to be challenged on its home

BELOW: **Not your everyday aeronautical juxtaposition: Sealand and Zodiac MBZ-31 airship F-BAIZ, used for advertising by clothing company Pernelle.**

BELOW RIGHT: **Flying along the shoreline of San Remo.**





ground. From Milan airport, local sorties were made.

A demonstration to prove the feasibility of an air link between Milan and the gaming casinos of San Remo on the Riviera coast was organised. Once permission had been obtained to fly to and from San Remo bay, the Sealand proceeded there from Milan and embarked some passengers for a short flight.

As Gordon and I were engaged with picking up the mooring, one of the male passengers, with characteristic Italian gallantry, opened the aircraft's door and prepared to assist the ladies of the party into the approaching launch. Unfortunately he used the red-coloured handle marked 'jettison', and this facility — demanded by the British airworthiness authorities — worked perfectly. The door disappeared outwards and promptly sank to the bottom of the bay.

Gordon was deputed to represent the company at the reception and luncheon. Our Italian agent despatched into the town to purchase some balls of twine, some sandwiches and a bottle of orange juice and Neville and I had an afternoon's fishing for the door, which was unmistakably visible through the clear water lying on the sandy bottom of the bay, at a depth which we considered beyond our diving capabilities.

With hooks fashioned from some heavy-gauge wire recovered from the spares and stones from the beach as 'sinkers', efforts to achieve a catch were too frequently frustrated by disturbance from the wash of sightseeing motorboats, and even pedalos circling the unusual spectacle of a moored aircraft. The door was finally retrieved before the provisionally agreed departure time for the return flight. The responsible gentleman was most concerned and apologetic for unwittingly causing so much trouble, and when we returned to the hotel in Milan we found he had caused two bottles of champagne to be delivered as a token of his contrition.

The remainder of the tour was completed without further remarkable incidents. G-AKLO was subsequently overturned in a forced landing near Pécy, south-east of Paris. It was rebuilt, refurbished and re-registered as VR-SDS on sale to the British Malayan Petroleum Company.



Two Sealand Is destined for Yugoslavian carrier JAT, YU-CFK and YU-CFJ, fly in formation with G-AKLV. KEY COLLECTION

SEALAND STORIES

The next Sealand on the British register, G-AKLP, had a chequered career before being re-registered VR-UDV and joining 'SDS in the Borneo oilfields. Shell bought a Sealand for use in Venezuela, which was delivered as YV-P-AEG.

G-AKLR and 'LS were sold to Jugoslovenski Aerotransport of Belgrade, and as YU-CFJ and 'CFK they operated a coastal Adriatic service. Two other Sealands plying a coastal service, but in Norway, were G-AKLN and 'LU. The former had been equipped for air-sea rescue with handrails on the port side of the hull and underwing carriers for air-sea rescue pack containers, assessed at Felixstowe by the Marine Aircraft Experimental Establishment. Subsequently sold to Vestlandske Luftfartsselskap of Bergen and taking up LN-SUF and 'SUH, they were used solely as flying boats, with the undercarriage removed. In this configuration, payload was increased to permit the carriage of eight passengers, baggage and mail.

The Christian and Missionary Alliance of New York bought G-AKLT for use in Indonesia and obtained the appropriate registration PK-CMA. However, in its third year of operating in and out of the most difficult terrain, it was forced down in a tropical thunderstorm in an inaccessible part of Java during 1953 and had to be abandoned. A replacement was ordered, and that November JZ-PTA was dedicated before delivery to Hollandia, New Guinea.

G-AKLV was obtained by Ralli Brothers and, as AP-AFM, used as a communications aircraft on jute plantations in Bengal. Two further Sealands, formerly G-AKLX and 'LY, were purchased by the government of East Bengal. As AP-AGB and 'AGC they went into service with the East Bengal Transport Commission.

The only production batch order comprised 10 Sealands for the Indian Navy. To meet the customer's requirements they were fitted with dual controls, extra tankage to give added endurance — up to six hours — and uprated Gipsy Queen engines. They bore the serials INS-101 to INS-110.

The prototype, G-AIVX, after making its first flight in January 1948 and fulfilling many functions as a trial installation aircraft, continued to be used in its later years mainly as a company communications machine. Operating solely as a landplane without wing floats and support struts, it thereby gained some increase in payload capacity, until finally being scrapped in 1955.

But what must have been the most outstanding of all the 25 Sealands was that originally registered G-AKLW. Bought by a wealthy Egyptian and converted to his special requirements, it was equipped with dual controls and extra leading-edge tanks. Six turquoise hide-upholstered seats were unique in that they could be reversed to face either forward or aft, and further originality in the luxurious decor was evidenced by the inclusion of a mahogany bookcase and a wine cabinet. Re-registered SU-AHY and named *Nadia*, the aircraft was delivered to Cairo in February 1952 by Capt Omar, personal pilot to the owner, Ahmed Abboud Pasha. First of the big spenders?

TAKING THE FIELD

The Harrier Field Force was a revolutionary concept for the Cold War RAF, yet despite its birth pangs, it soon evolved into an unrivalled capability

WORDS: BEN DUNNELL



"I was with the then station commander, handing over to me in January 1972, in his office to sign the paperwork when there was this almighty bloody bang and a Harrier went straight into a German village, killing the pilot. That was not a good start."

AVM George Black was being deliberately understated. When he took over as officer commanding RAF Wildenrath, the Harrier GR1 had only been in RAF service for some three years, and the V/STOL jet was still in its relative infancy. So was the concept of operating it in the field, the arena in which it was meant to excel — and why it was deployed to Germany in the first place. Even this enormously experienced fighter pilot had a great deal to learn.

"I had been on Lightnings", Black told the author, "and the fighter side, for most of the time, and was always complaining that I'd never had a tour in Germany. The then Air Secretary said, in their wisdom, 'You can go and command Wildenrath in Germany, and we'll give you the full Harrier conversion at Wittering'. At that time it was very early days, so it was quite limited on the training, but I did manage to get the full course including the weapons training and everything. That was lucky, because it wasn't the easiest of aeroplanes to get used to. What you had to do first of all was to fly five hours on the Whirlwind helicopter, to understand how to get in and out of small spaces. That was quite an interesting thing for someone like me, who'd been accustomed to the 170mph landing speed of the Lightning."

It was the first helicopter experience he'd had, and hardly a favourable introduction. "The Whirlwind was a dreadful aeroplane. I've since flown some later helicopters, and it was pretty basic. Once you got used to it, I suppose it was OK, but five hours was really just jumping in and out of clearings in the trees, getting used to the way you would get the Harrier to stop and then come down into the clearing."

RAF Germany had welcomed its initial Harrier GR1s in 1970, when No IV(AC) Squadron re-equipped at Wildenrath. It only became operational as a ground attack unit during April 1971, a few months before George Black arrived at the West German station — one of the so-called 'clutch' bases newly built west of the Rhine in the early post-war years — and was still working up to a declaration in its primary role of battlefield reconnaissance. No 20 Squadron came next, on 1 December 1970, but took some time to reach full strength. Only on the first day of 1972 did No 3 Squadron join them.

"The concept hadn't been written for using the Harrier in the field in Germany", recalled George Black, "so that was a challenge I got from the commander-in-chief — to write the concept for the Harrier's field operations. I ended up as the first Field Force commander, which was very, very interesting. At the time I got there we only had one-and-a-half squadrons. Then, eventually, we got to three squadrons, and we then had to decide how we were going to get into the field, where we were going to go — which was not easy, because the Germans didn't like you wandering all around their different areas with the noise and things of that kind, so a lot of that was done within the army training areas initially. Then we had to find six field sites for every deployment."

> ***"The concept hadn't been written for using the Harrier in the field"***

The war sites — surveyed in conditions of considerable secrecy, and only known to a select few — were all situated in the part of West Germany which was the responsibility of 1(BR) Corps, the main combat element of the British Army of the Rhine. Each of Wildenrath's Harrier squadrons had two locations earmarked. In the event of war, No 233 Operational Conversion Unit at Wittering would have deployed to reinforce them, meaning eight Harriers could be based at every site to conduct strikes against Warsaw Pact armour using BL755 cluster bombs, 68mm SNEB rockets and the 30mm ADEN cannon or, in the case of No IV(AC) Squadron, tactical reconnaissance missions. Exercises, of course, were carried out at separate locations so as not to give away the whereabouts of those chosen for wartime use. Different sites came to be

LEFT:
Although showing No 1 Squadron Harrier GR1s engaged in March 1972's 'Snowy Owl' field deployment exercise rather than examples from one of the RAF Germany squadrons, this illustrates very well the nature of the Harrier Field Force concept.
CROWN COPYRIGHT



ABOVE: The changing of the guard: two Harrier GR1s flank an outgoing Canberra B(I)8 as No 3 Squadron re-equips in January 1972. CROWN COPYRIGHT

BELOW: George Black (right) signs a Harrier GR1 back to its groundcrew following a sortie from Wildenrath during his time as station commander there. VIA IAN BLACK

BELOW RIGHT: The second RAFG Harrier unit was No 20 Squadron, two of whose aircraft are here on exercise at a field site. CROWN COPYRIGHT

established within the Sennelager training complex, but the aircraft went elsewhere too, especially in the area around Paderborn.

"Once the deployment was fixed", Black continues, "you then had something like 400-plus vehicles to go from Wildenrath into the forward area, taking manpower, food, weapons — a whole list of things you would take just to keep you alive in the field. That was a very difficult thing, going from Wildenrath all through the Ruhr and then out the other end to get up into the forward area near the East German border. I always said that this was a weakness in the early days of the Harrier, because I just had a terrible feeling that if I'd ever had to do that for real, half of it wouldn't have turned up. There were also about 20 train-loads of stuff — weapons and various other things — that had to go forward, and spares support areas, roads and various other things, because you could never guarantee that some of those field sites were going to be free from inclement weather and so on. That was an option if we'd had to go for from the main base. The concept was written around it, and it was highly successful. The army was very pleased.

"For the war role we had to look at sites, and I suggested we should maybe examine service station

> ***"I had a terrible feeling that half the equipment wouldn't turn up"***

real; we would certainly use areas that were a bit more hardened. The army put down some excellent mats" — MEXE (Military Engineering Experimental Establishment) pads — "and so forth, and we operated in some fairly rough conditions, but I had no confidence that in wartime we would have been able to continue doing that. I think the best we ever had was something like 480 sorties in under 12 hours, so it was a very well-designed aeroplane for that role."

A challenging one, though, as evidenced by the tragic accident George Black referred to at the start of this piece. It took place on 12 January 1972, when a No 3 Squadron Harrier GR1, XW918, crashed in the course of a demonstration to a visiting group of Swiss officials, this at a time when the Swiss Air Force was showing an interest in a possible Harrier acquisition. The aircraft came down near the village







ABOVE:
No 3 Squadron GR1 XW768 on approach to Wildenrath in September 1972, at which point the unit was still working up on the Harrier.
ADRIAN M. BALCH

of Tüschenbroich, not far east of Wildenrath, but the pilot was killed while ejecting.

"The standard of aircrew going on to the Harrier from Hunters left a lot to be desired, in my book, and I've said that for a long time", commented Black. "I'd come from the Lightning force where, for a lot of good reasons, you had to be pretty sharp. It wasn't an aeroplane that you played around with. I just found that a lot of people didn't quite have that sort of attitude and level of experience that the Harrier needed. It was not a Hunter, it was an aeroplane that needed to be handled carefully — you didn't fly it without thinking what you were about to do with it.

"We progressed a lot from the sort of Harriers I'd flown with the OCU at Wittering, which were very basic. The early Harriers really had nothing in them, other than the basic instruments. That was the problem about trying to get into the hover, so you could make sure you were going to drop down and land on all the wheels. But once we got going, the aircraft had better inertial navigation systems and other items that were fitted. It was a very rugged aeroplane to operate in the field, and everybody who came to see it was quite impressed with what we did, including the people from Hawker Siddeley Aviation. The engineers were absolutely astounded with what we were doing with it. Once I'd got used to it, it was a great machine to operate. I've probably got around 300 hours on it. It was a good weapons platform, quite steady."

As the aircraft approached maturity, its teething troubles were soon ironed out. "With the Pegasus engine, we suffered from over-tightening of bolts. The net result of that was that you would get a bolt breaking and going through the engine, and that was the end — the blades would start to break up. We had a number of unfortunate ejections as a result of engine failures, until we got the problem solved. That was probably the biggest problem with the engine. The surging we then solved by putting various things inside the intake. In the early days I guess it was never quite as reliable as you would expect from an engine today, but it was unique, of course.

"The engine was one of the areas we had problems with. Instrumentation was another one. The instrumentation was not very good on the early aircraft, and it was one of the early head-up displays. It lacked stability, so if you were starting to manoeuvre you might find that the display was just lagging slightly behind you. We lost one or two aircraft when people had shot into cloud, then suddenly found they couldn't follow the head-up display. We lost the station commander at Wittering as a result of that, up in Scotland [in XV799 on 12 September 1972]. The stand-by instrumentation was poor as well, so you had the combination of a poor head-up display and not the greatest of stand-by instruments to cope with it."

Once its modus operandi was written up, the Harrier Field Force set about exercising the capability. Known as WARLOC, an abbreviation of 'war locations', it was like little else the RAF had possessed before. "The head of the Luftwaffe came



BELOW:
A No 1 Squadron jet on MEXE pads, laid down by the Royal Engineers, at Milltown in Scotland.
R. L. WARD





TOP:
The advent of the Harrier GR3 in 1973 represented a major advance, with the Pegasus Mk103 engine, greater weapons-carrying capability, the laser ranger and target seeker and a radar warning receiver. No 3 Squadron brought it into operational service.
CROWN COPYRIGHT

ABOVE:
At an unidentified field training site — probably in the vicinity of Paderborn — a No IV(AC) Squadron Harrier GR1 comes in to land some time during 1973-74.
JIM MARTIN VIA PETER MEARS

down to visit, and he joked, 'When I was flying Messerschmitts in 1944, we were doing exactly what you were doing — we'd just [...] move on to another site'. He said he was delighted to see that sort of concept. The army was very pleased, because they were getting close support from us within 10 minutes of a call-up.

"They decided to do tactical evaluation in the field — they'd never done that before — so they came out, and one of the things we were asked to do was to open the war stock of rockets. I said, 'We're not allowed to open the war stock,' but the head of the evaluation team said, 'No, we want to get it opened, and you've got to put war stock onto the aircraft in the field'. Eventually RAF Germany gave the authority, and I'm very pleased they did, because when they got the rockets out and we had to put them together, would you believe that the clips that were meant to go on there to lock the things together were half an inch short. We could never have put the war stock together to fire. As a result of that, all the war stock had to be re-modified. There was a plus point for tactical evaluation."

Exercises took place three times a year. "They were in spring, summer and late autumn. We went for two weeks, we lived under canvas, we ate in the field kitchen. Everything was done in the field — nobody went anywhere except within their own little site. I say that, but at the same time there was a good German pub nearby, and we all used to meet up there on a Saturday night. The Germans wouldn't allow us to fly on Sundays. But we didn't stray far afield... The Soviet equivalent of BRIXMIS, their spies in Berlin, took a keen interest in trying to find out what we were about. They were always wandering around the sites, being arrested and what-have-you. We took everything into the field, the RAF Regiment, the Royal Engineers, the Royal Signals, police and police dogs, and all this had to be fed and watered. It was quite a logistics planning exercise to write the whole concept, and it was quite detailed when it was finally approved, but it stood the test of time.

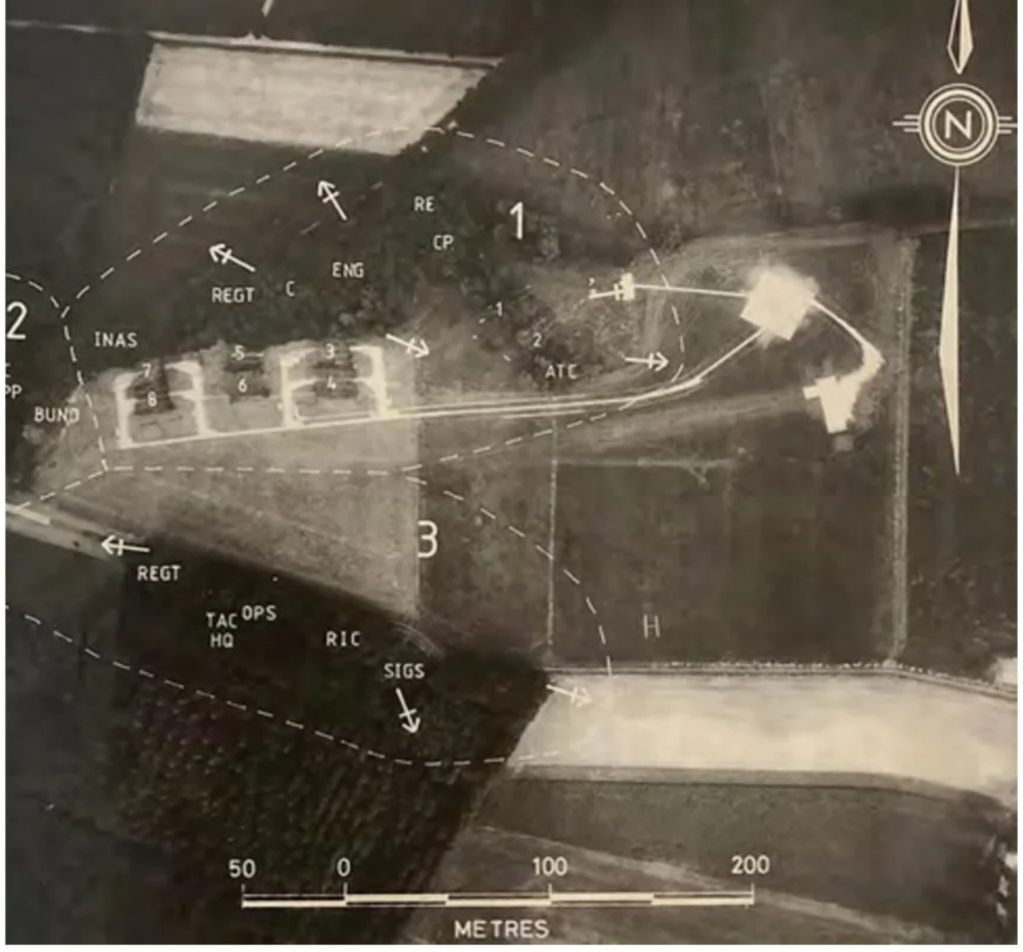
> ***"I think we'd have done very well in a major Soviet advance"***

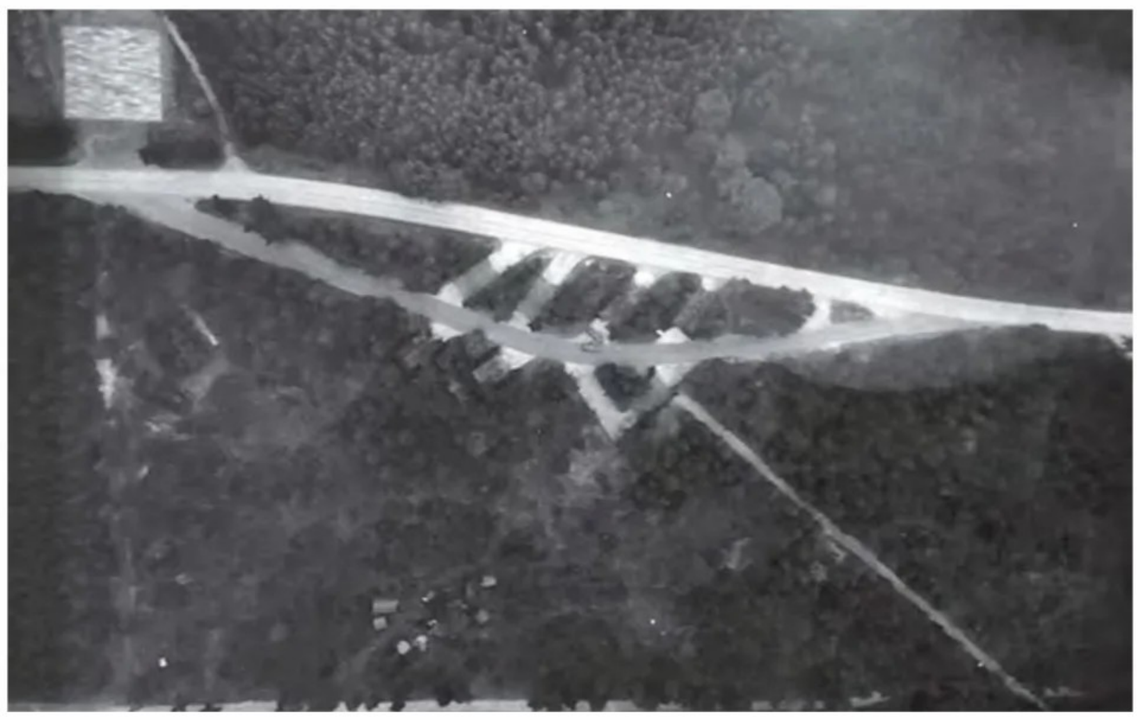
"Painful memories? Probably 'March Hare' in 1973, I think it was. We went into the field in March, and gales started up, rain, everything. I had to get everybody out of the field because I was quite convinced that we weren't going to survive unless we headed to the German barracks. The trees came down, but there was next to no damage to the aircraft — I was most surprised. It took us about 10 days to get the aircraft out afterwards. You had to be mindful that in war you would have to go into a hardened environment. But the autobahns were great. When they were building some of the newer autobahns in northern Germany we got permission to fly off them, and they were really were super... There was a good opportunity there had we had to use them in a war operation."

Gradually, Black came to have much more confidence that the concept would work. "I think we'd have done very well if there had been a major advance by Soviet forces in Germany. We could have gone further and further back. We might have gone back to our main base; the various roads at the main base had been so conditioned that we could have used them in an emergency. If we couldn't have got into the field, if we'd been 'caught short', then we could use places on the base to hide the Harriers and also take off from some of the roads on the base. That was an option. I think we would have had to move quite a lot if the Soviet advance had been as rapid as they were predicting — I was fairly sure we would have had to be ready to throw a bag in the back and get under way.

"The week or 10 days before we went into the field, everybody had to do the minimum of 10 vertical landings and short take-offs before they were cleared to operate in the









CLOCKWISE FROM TOP LEFT: Exercise 'Blue Sky' in 1971, and one of the first Field Force deployments; these three GR1s are parked in the open, contrary to usual practice. VIA PETER JEFFERIES

A ground defence plan for a site used during July 1980's Exercise 'Hill Foil', showing the large area it occupied and the way it was divided into sectors, each defended by their occupants. VIA PETER JEFFERIES

An oblique colour shot of a field site affords an idea of how well the hides blended into the woods — while no personnel and support vehicles were there, at least. VIA PETER JEFFERIES

This optical camera image offers a good overview of a Harrier field training site, with the hides located in the centre and the VTOL pad at top left. VIA PETER JEFFERIES

field. There had to be a rapid training programme so everybody was fully qualified to take that on, because some of the strips we were using for the take-offs, in farmers' fields, grass fields and things were pretty short, and you had to get the nozzles right. The landing-on was fairly straightforward because you were down on fuel, and everybody was very well-trained in that.

"You had to be careful you didn't hang around for too long in the vertical in coming down, because it started to ingest the hot gases, and you began to lose thrust when that happened. You got into the vertical, and you came down, and that was it. That was an area that was always critical. You had a flashing light that came on, a 15-second warning light, and that told you that you were beginning to get a bit hot and running the engine beyond its limits. We had water injection as well for the take-offs, with a 50-gallon tank of demineralised water which sprayed into the engine to cool it down for the vertical lift. We didn't often use that; probably in the middle of summer we would, but not the rest of the time. It was just an extra 50 gallons of weight."

More of an issue, when the weather got bad, could be the mud. "A local German farmer had this Mercedes-Benz Unimog truck which had about 24 gears on it. We were talking about it, and for two bottles of whisky he said, 'I've got two. You can borrow them to get your Harriers moved.' So there we were, drinking whisky with him to get to borrow these Unimogs. We went back, I briefed the commander-in-chief, and we ordered eight Unimogs for the Harrier force, bought from Mercedes. They were fabulous! They took the aircraft anywhere you wanted to get them. The Land Rovers we had were bloody useless…"

George Black's tour at Wildenrath came to an end in 1974. His successors continued to refine the Field Force/WARLOC capability, and in time the Harriers would move to another station. After the retirement of RAF Germany's air defence Lightning F2/F2As in 1976-77, their Phantom FGR2 replacements took up residence at Wildenrath, while the Harrier squadrons transferred east to Gütersloh, closer to Sennelager, to the field sites and to the likely area of wartime operations. This reduced considerably the logistical burden of deployments, whether on exercise or in anger, and thus increased the force's effectiveness. But, rather to the surprise of some on the outside, it had already been shown to work.

As George Black reflected, "It was a brand-new concept, and a number of people in London didn't believe in it anyway. They said, 'No, you'll never operate Harriers in wartime.' But we did, and we had fantastic sortie rates, turning them round, filling them with fuel, rearm and away."

AEROPLANE *meets*

ARTHUR ORD-HUME



KEY/BEN DUNNELL

A doyen of the British light aeroplane scene, who flew many a classic type as well as being in the homebuilding vanguard

WORDS: BEN DUNNELL

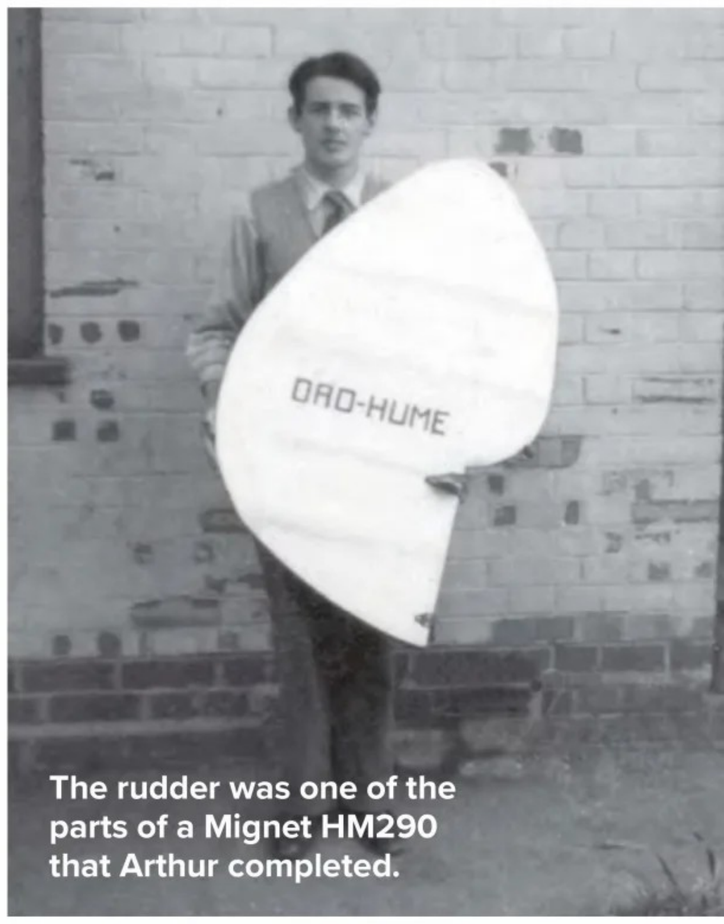
The ability to build an aircraft at home is something we take for granted nowadays. Some creations are unique, others are types turned out in their thousands, but all are the result of dedication, attention to detail, and enthusiasm. Above all, aeroplanes capable of amateur construction — the standard of which is often far from amateurish — have enhanced considerably the ability of the man or woman in the street to go flying affordably, and take in the joys of aviation. But it wasn't always so.

As peacetime private flying resumed with a vengeance, the British authorities viewed homebuilt machines with suspicion. In fact, they were effectively prohibited. That situation may have persisted for a long time, were it not for people such as Arthur W. J. G. Ord-Hume. Unafraid to rock the proverbial boat, this engineer, aircraft designer and pilot took on officialdom and won. He was an early member of the Ultra Light Aircraft Association, set up in 1946; today, it's the Light Aircraft Association, with some 7,500 members and 2,700 aeroplanes under its auspices, including a lot of historic types. And Arthur himself flew many notable aircraft when they were rather more contemporary — the inevitable Moths and Austers, of course, but also Comper Swifts, an Avro Avian and even the Zaunkönig.

Yet there's much more to Arthur's life than aviation. His other passion is music, derived in part from his grandfather James Ord-Hume, a distinguished musician and conductor. In the field of mechanically produced music, he's a worldwide authority. He has written extensively on both, as well as clocks, hovercraft, local history and perpetual motion machines. His home in Guildford, where his wife Ruth serves us lunch, is packed full of material on all. There Arthur still does technical drawings of his own, not using computer-aided design programs or anything so modern, but an extensive set of traditional instruments.

His earliest aviation memory takes him back to early childhood and a holiday in Shanklin, on the Isle of Wight. "We were sitting on the edge of the airfield and I was picking buttercups… I wandered further

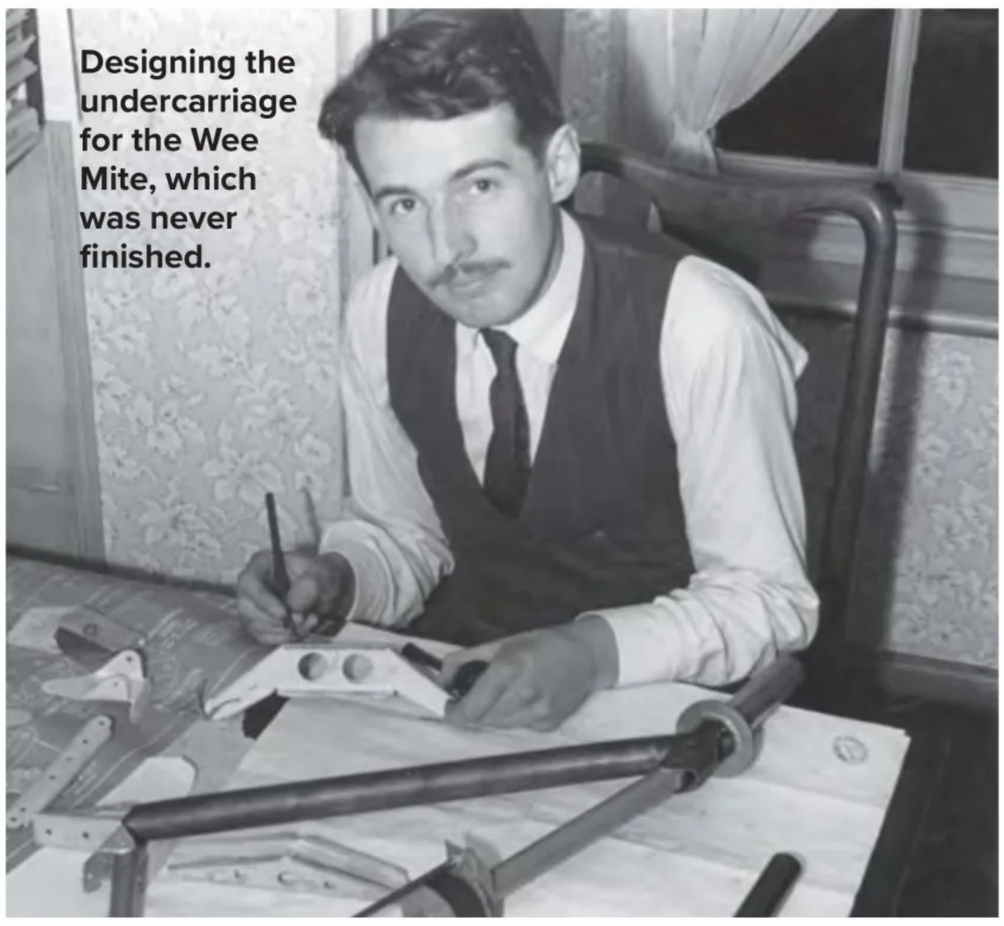




The rudder was one of the parts of a Mignet HM290 that Arthur completed.

The second rebuild of Luton Minor G-AFIR in the front garden of the Ord-Hume family's Pinner house.

ALL VIA ARTHUR W. J. G. ORD-HUME UNLESS OTHERWISE CREDITED



Designing the undercarriage for the Wee Mite, which was never finished.



The complete Minor G-AFIR on the back lawn at Evelyn Drive, Pinner, where it just fitted between the trees.



RIGHT: A fine portrait of man and Minor, taken by outstanding aerial photographer Charles E. Brown — a friend of Arthur's.

and further out, and suddenly heard this terrible noise. I turned round and saw a huge machine bouncing over the ground, chasing me, so I turned and fled in terror. Then it went up into the air and over the top of me. It was a flying machine [an Avro 504], and I was hooked."

A little later, living in Pinner, there were interesting people to meet. His mother worked for an agent in the entertainment business and at the BBC, while his father knew prominent figures in the musical world. "The house was filled with people like Sir Thomas Beecham, Arthur Askey, Tommy Handley. I got to know all of them when I was a child. This got me interested in music. And, of course, the film actor and comedian Will Hay used to visit. He was based at Croydon where he had been one of Amy Johnson's instructors. Hay said to my father, 'Come along to Highgate golf course, bring your boy with you, and we'll go flying in my Puss Moth.' Apparently — and I had to read my father's diary to find out — we turned up and Will Hay flew over in G-ABLR, but the wind wasn't in the right direction so he didn't land. I didn't get my flight on that occasion."

Instead, he had to wait until he was four or five to go into the air. He did so from Shanklin in Spartan Three Seater G-ABAZ, "sitting on top of a huge pile of cushions so I could see over the top. My second flight was with Cecil Pashley at Shoreham, again sitting on top of a huge pile of cushions, in an Avro 504N". When war broke out, experiencing German raids on London helps explain why Arthur became more interested in civil, rather than military, aviation.

> ***"We had masses of enthusiasm and we had bugger-all to fly"***

And receiving Henri Mignet's book on how to build a Pou-du-Ciel as a Christmas present from his father was another turning-point.

With hostilities over and private flying permitted again, in February 1947 Arthur read in *Aeromodeller* magazine about Mignet's updated Pou, the HM290. He duly wrote off for the plans. "I built the rudder and all the wings", he says, "but then I came to my senses". Progress was slow, and there was no guarantee of obtaining airworthiness approval from the Air Registration Board. That December, Arthur wrote to *The Aeroplane*, asking whether the British pre-war ban on flying Mignet's designs after the series of 'Flying Flea' accidents would apply to the HM290. Editor Thurstan James responded, saying he believed the HM290 would not be prohibited, but that it "would be treated as a normal prototype", and thus "would have to be submitted to the ARB for approval". He let the project lie.

Even so, Arthur's admiration for what Mignet achieved is still strong. "It took people quite a long time to realise that Mignet, with the 'Flying Flea,' had done something which nobody else had managed to do. He'd sown the seed in the minds of people that the ordinary person could build an aeroplane". Arthur subsequently met and corresponded with Mignet. "He was a great enthusiast… But he was a bitter man towards the end, really."

It was in the RAF that Arthur learned to fly, completing his training on Harvards with No 2 Flying Training School at South Cerney. However, when serious illnesses befell both his parents, his air force career was to be cut





short. The service was enormously understanding, transferring his posting from Leuchars to Hendon, nearer home, where he occasionally flew Ansons and Proctors, and instructed air cadets on gliders. He was also able to complete his University of London engineering degree.

But even before this, light aeroplanes had become a big part of Arthur's life. When the Ultra Light Aircraft Association was established, under the initial chairmanship of Ron Clegg, he soon became one of its youngest members. A lack of money meant he couldn't afford the regular subscription until later, but in 1948 that didn't stop him buying an aircraft that today is among the jewels in the Shuttleworth Collection's crown: Bristol F2B Fighter D8096.

"C. P. B. Ogilvie had been at Willesden", Arthur recalls, "but he moved to Primrose Garage on the east side of Watford. When I got to know Ogilvie, he asked if I wanted to buy any aircraft bits. I went to see him, and I found that what he wanted to sell me was a table full of World War One aircraft parts. Quite useless for what I wanted, and far too big for anything else. He said he had a load of Westland Wapiti wings, he had a BAT Bantam, a Bristol Fighter and lots of Avro 504s.

"I then went down to his garage, and there, on top of an internal office, was the BAT Bantam broken in two. It was a plywood monocoque, and at that particular time there was no way I would have been able to do a plywood monocoque. I didn't have the skills then, and I wouldn't have been able to get the materials. I left it; it was subsequently sold, and it's been fully restored in Holland [the aircraft is now on show in the Rijksmuseum in Amsterdam]. Outside on the pavement was a very thin lamp-post, the sort you'd be afraid to lean on in case it fell over. Padlocked to it with thick chains was a huge aircraft engine, and it was off a Zeppelin. I asked why it was chained up, and he said, 'I don't want anybody pinching it.'

"Also outside was a shed, all battered and leaking. He opened it, and there was a Bristol Fighter, complete with four wings and the same number of tailplanes. He told me he wanted £100 for it, but I hadn't got £100. I found out that the Avros and the Wapiti wings were piled up on the side of the Grand Union Canal, in a tangle of brambles. Ogilvie said I could have them, but I said no. I came away, and went back to Elstree a bit miserable… Anyway, then I got an urgent letter from him, saying the council had given him a fortnight to clear the site. He had to turn all this stuff out to burn it. If there was anything I wanted, I should let him know.

"Austen Chamberlain lent me his truck, and we went and got the Bristol Fighter — all the wings, all the bits and pieces. In five or six loads, we got it to Elstree and put it in a hangar. I didn't know what to do then, so I decided to wait and see what happened. We approached Shuttleworth first and foremost, but they weren't interested. Then we got on to Bristol, and they said they'd love to rebuild it as an exercise for apprentices. We shipped the whole lot off to Bristol". In the manufacturer's ownership, D8096 flew again during 1951.

The Ultra Light Aircraft Association's grandly titled Experimental Group, which Arthur joined in 1948, occupied a dilapidated blister hangar at Elstree. "We had the Beneš-Mráz Be 550 Bibi, OK-BET, which became G-AGSR; Henry Rose-Dale's Auster Autocrat, 'AIGT; the Taylor Watkinson Dingbat, 'AFJA; the remains of A. P. Golay's Comper Swift, 'ABPE, and occasionally Tony Cole's Swift, 'ABUS. We had a BAC Drone which had been converted back into a two-seat glider. We had a battered old Austin car, and a BSA three-wheeler. We had masses of enthusiasm and bugger-all to fly. Ultimately we had a Moth Minor, which we did a lot of training on."

All the while, Arthur was on the lookout for interesting aeroplanes and ways of furthering his

LEFT:
The sad end of G-AFIR's first post-war flying career.

BELOW LEFT:
Beneš-Mráz Be 550 Bibi G-AGSR was one of the ULAA Experimental Group's interesting charges. It took a while to get it flying regularly; then it was involved in a fatal accident during October 1951.

WORLD AVIATION ARCHIVE/ AIRTEAMIMAGES.COM



BELOW:
Paul Simpson's pre-war Standard proved a trusty towing vehicle.



Bristol F2B D8096, newly restored by its manufacturer, poses with the Brabazon. The 'Brisfit' may not have survived for this and many other occasions were it not for Arthur. BAE SYSTEMS



Traversing the open fields of Hertfordshire, pleased to be back in the air again.



Running up the 50hp Zündapp engine of Zaunkönig G-ALUA.

homebuilding ambitions. He rescued Robinson Redwing G-ABNX by taking the 1932 biplane from the Redhill hangar where it had been abandoned. Without that intervention, the Redwing might have ended up on a bonfire. Elsewhere on the airfield he found two dismantled Airspeed Horsa gliders, one of which he bought for £5 for its wood. This he used to begin construction of a vaguely Piper Cub-esque light aeroplane of his own design, the O-H2 Baby, which was not destined for completion. Abandoning that and the HM290, Arthur concentrated on restoring Comper Swift G-ABTC for the Experimental Group and helping his friend Paul Simpson — a Loughborough College of Technology student who also lived in Pinner — return Aeronca 100 G-AEVT to flight.

It was Simpson who, in February 1949, alerted Arthur to the fact that a Luton Minor was up for sale in Barrow-on-Soar. Hanging from the roof of a garage, it was G-AFIR, built to the original Minor plans published in *Practical Mechanics*. "First flown in 1939", Arthur recalls, "it was let down by its Anzani engine and force-landed in a cornfield where it lay exposed to the elements for three months until the corn was cut and the farmer allowed it to be removed. The remains were acquired by me for one main reason — it possessed a permit to fly, registration documents and insurance papers. This was proof that it had been a flying aircraft. As it stood at that time, any repairs were to be no more than 20 per cent of the airframe and the same engine had to be used as pre-war."

First he purchased a French powerplant, a 32hp Mengin O-95 flat twin, but it lacked magnetos. "Coincident with this, I found out that the ULAA had bought the remaining stock of J. A. Prestwich's new Aeronca-JAP engines manufactured for the defunct Aeronca production at Peterborough. I bought one for £80". The airframe cost £25, and Arthur went with Paul Simpson to collect it. They towed it to the Ord-Hume home in Evelyn Drive, Pinner, behind a 1937 Standard belonging to Paul's father.

A shed was erected in the back garden at Evelyn Drive, and work got straight under way. At last, Arthur

had an achievable project of his own, and the young man building his own aeroplane in suburbia attracted a lot of press attention. When it had to emerge from the makeshift workshop and go onto the front lawn, it also incurred the wrath of the letting agent: "I must ask you to arrange for it to be removed as soon as possible", read a snooty missive. "The Company takes exception to work of this nature being carried out on the premises…" But he still had a major hurdle to overcome. "Officially I now had a pre-war-registered and permit to fly aircraft with a brand-new airframe and an untried engine combination. I was unlikely to get approval to fly such a mish-mash, even though it was a better creation and engine than the pre-war job."

In the hope that he might be able to exert sufficient pressure on the ARB for the Minor to fly, Arthur obviously needed a civil licence. This he obtained at Denham, going solo in Taylorcraft Plus D G-AIXB on 13 May 1950. "Then I started flying little aeroplanes, and I found them so much more fun than big, fast things". Paul Simpson's crash in the recently flown Aeronca just a few weeks later was a blow, though he survived. He and Arthur soon bought Aeronca C3 G-AEFT as a replacement project.

Having been towed to Elstree behind the trusty Standard, the big day for the Luton Minor was 8 April 1951. What Arthur intended to be a fast taxi turned into a brief hop, followed the next day by a full circuit. It performed perfectly, testament to skilled workmanship despite a tight budget. Arthur estimates that he spent just over £158 on getting G-AFIR flying, in the course of 977 working hours. But what of the all-important permit to fly?

"Every newspaper had an air correspondent", says Arthur. "A lot of them had written material on me building an aeroplane in my parents' back garden, so that was quite a good start. One day I sent a press release, saying to come out to Elstree aerodrome on Saturday morning; I was going to fly my aeroplane and break the law, after which I shall be arrested. They came out — it was a news story. That's when a motorcycle messenger came out with the permit to fly, the first one for a homebuilt aircraft. The local policeman was very disappointed because he wanted to appear in the papers, but I pacified him and made his journey worthwhile by having him photographed giving me the permit."



ABOVE:
A long-standing association with the Elstree Flying Club meant Arthur often flew its Chipmunk, G-AOSY, which was one of the first to be civilianised by engineer 'Tubby' Simpson and the club secretary, the late David Ogilvy.

As a homebuilder, Arthur was far from being alone in his struggle for official approval. "There was Ted Felce up in Leicester with a Luton Minor, there was A. R. Weyl with the Dart Kitten. There was W. E. Harrison, who ran Harrison's Garage at Loudwater, who owned [Kitten] G-AEXT and a pre-war-manufactured kit of parts which later became 'AMJP. There were two people who had Tipsy S2s, there was E. J. Pope in Ealing who also had a Luton Minor. All these people, all dead worried that they had aeroplanes they couldn't fly. I was the first one to get them in a position that they could."

> ***"The Luton Minor incurred the wrath of the letting agent"***

The high-ups in the ULAA hadn't been a great help. "They were ex-RAF officers, and a few army officers as well. First-rate people, but, to me as a youngster, not filled with the drive of enthusiasm. I was the one who pushed the progress. Flying a Luton Minor the way I did didn't make me any friends in the ULAA, although I achieved the one thing they hadn't: I got a permit to fly."

Alas, G-AFIR's renewed flying career didn't last long. On 1 May 1951, it was badly damaged in a forced landing near Watford. "One day, after flying, I topped up with fuel, stored the aircraft in the hangar and travelled back to my RAF station. I was away for about six weeks and was thus unaware that a batch of fuel had been delivered that was contaminated, and there had been a number of incidents of club and other private owners suffering engine failure with the result that everybody had drained their tanks and refuelled with clean stuff — all except me. I took off, the engine stopped, and I came down rather hard in a very small field."

Back at Evelyn Drive, G-AFIR entered a full rebuild. As for Arthur, having left the RAF on compassionate grounds in August 1953, he went to work as an engineering liaison officer for Fairey at its Hayes factory. There was also a brief spell with de Havilland, but then, "I met somebody from Handley Page, and he said they were looking for young enthusiasts like me to come and join the team. He told me, 'We'll pay you a bit more than de Havillands'. So, I went to the drawing office at Cricklewood, and there found myself working on the Victor."

Chances to fly some interesting light aeroplanes were not to be passed up, when time allowed. Among them were Ron Gillman's Avro Avian G-ABEE, Cyril Mills' Moth Major G-ADHE, and the Vintage Aeroplane Club-operated Avro Club Cadet G-ACHP. Aeronca G-AEFT took to the air in March 1954, though it flew increasingly seldom as religion took over Paul Simpson's life, and he parted with it the following year. The pusher-





ABOVE:
Pictured from Don Ellis's BA Swallow G-AFGE, new Minor G-ASAA makes its first flight on 29 July 1963.

ABOVE RIGHT:
In the attic of Arthur's small bungalow at Lake, between Sandown and Shanklin on the Isle of Wight, a revised version of the Luton Minor takes shape. It left through a hole in the roof.

engined BAC Drone is described by Arthur as, "a bit of an acquired taste. It was like trying to get away somewhere, but with a fellow on a motorbike following you very closely behind."

By contrast, he adored the Comper Swift, having piloted G-ABTC and 'ABUS. "It was like a Spitfire. It appeared to have been made to fit you. When you were in it, you were part of it. When you were out of it, one of you was incomplete, and it was usually you. I loved it — it was a tremendous aircraft. It was nimble, it was fast, and that radial engine was so sweet. It's hard to put into words. A love affair with a machine takes a bit of explaining away, but that was beautiful."

A fascinating experience was the Braunschweig LF-1 Zaunkönig, the high-wing German STOL light aircraft which had been evaluated at Farnborough after the war. "When this work was completed, a number of aircraft thought suitable for civilian use were put on the open market. Among them was a brand-new Bücker Bestmann, which became G-AKAX. Complete but without the necessary paperwork, it was moored outside the blister hangar at Denham and stayed there for a few years until it had rotted away, and could be swept up and burned. The Zaunkönig was offered to the ULAA, and because we had contacts in useful places we were able to get the out-of-sequence restoration G-ALUA, the nearest we could get to ULAA.

"I remember on one occasion John Fricker was going down to Eastleigh, and asked me to help him start it. It was a bugger to start. You could spend half an hour prop-swinging, blowing-out, sucking-in, trying to get it going. Then, all of a sudden, it would get going and be as sweet as anything. John set off for Southampton, and we went into the clubhouse exhausted to have a cup of tea. When we came back out, we could still see it. It was slow, wonderfully slow. You could do wonderful things with it. I got a couple of hours' flying in the Zaunkönig, which meant I must have flown several hundred yards.

"I got my twin rating on a Miles Gemini at Panshanger. The person who took off in the aircraft after me had a propeller shear off after the crankshaft went. He didn't know which engine had gone wrong, and he shut down the wrong one. It went into a steep turn, crashed and burned up. I like to think I might have done it a bit better, but you can never be certain. That, really, was so I could fly Dragon Rapides. Danny Speck had bought a bunch of Tiger Moths for crop-spraying, and in on the deal was a Rapide. He knew I liked Rapides. But I didn't use my twin rating often, partly because in those days I was paying for my own fuel, and at £1 10d a gallon it was quite a lot."

> ***"I thought, do I fly to the runway or what? I'd just wear out the tailskid"***

Just as before, it took a long time for Arthur to return the Luton Minor to an airworthy state. The third incarnation of G-AFIR got airborne from Elstree on 20 May 1956, and he considered it much improved. Only a small adjustment to the tailplane incidence was deemed necessary in terms of post-flight tweaks. Testing went without a hitch, and once more Arthur had his own aeroplane with a permit to fly.

He was determined to enjoy it. In November 1956 he landed the Minor on the 10,000ft runway at Stansted, then virtually deserted, stopping in just 85ft. According to *Flight*, Arthur "headed for the distant airport buildings led by an urgently driven 'follow-me' van. At 20kt the van was still gaining; at 30 the Minor was holding its own and cruising comfortably 2ft above the runway. Arthur's arrival was matched by his departure that evening from the tarmac in front of the control tower". He recalls today, "I went up to the tower and asked which runway was in use. He said, 'That one.' It was a mile away. I thought, do I fly to it or what? I'd just wear out the tailskid. So, I asked what there was stopping me taking off from there…" Another time he demonstrated G-AFIR at the RAF Hendon Battle of Britain display, despite a very strong wind. "I flew the distance of the runway backwards", he smiles.

The Minor was now a very significant type for the British lightplane movement. "When we formed the ULAA, what was wanted was an aircraft that could be built by amateurs… John Britten and Des Norman had just come out of de Havilland's tech school, and they said yes, they would design an aircraft for the ULAA. The result was the BN-1F, or the 'Finibee', which was BN-1F backwards. It didn't really work; it crashed on one of its first flights [in 1951]. It was rebuilt,

various alterations were made to it, and it still didn't work. That's when Edward Mole [the ULAA chairman] asked me if I could design a really simple aircraft, which was the Wee Mite. I almost completed it, but as it went on I got more and more worried that the aircraft was going to cost money which we didn't have. It was an unknown quantity, it was a new aircraft which was going to have to be built and thoroughly tested and evaluated. I saw the price rising and rising.

"One day we had a meeting with Maurice Imray, Capt Stourton and A. R. Weyl. Weyl had produced a successor to the Dart Kitten, but it was complicated. Bless him, he was a nice man, but Weyl didn't really do simplicity. I began to think about this, and then I said there was an aeroplane out there already called the Luton Minor, which came out in 1938. Why don't we update that? I dropped the Wee Mite… the rest, as they say, is history.

"I had a silly idea: could lightning possibly strike the same place twice? I went to London to see George Newnes, the publisher of *Practical Mechanics* and said, 'Do you know, just before the war you did this series of drawings for the Luton Minor? How do you fancy a complete set of drawings for a new version of it?' I was thinking he'd say, 'No, we've done that', instead of which he said, 'What an excellent idea! When can you start?' We did 12 articles in 1958-59."

With the Minor's original designer, Cecil Latimer-Needham, Arthur set up Phoenix Aircraft during 1958 to market the new LA4a version. He also revived the LA5 Major as the LA6. At Panshanger he formed the Agricultural Aviation Company, to tap into the emerging market for aerial crop-spraying. It carried out various experiments with Tiger Moths — and other, less suitable machines.

"I had a miserable relationship with Freddie Laker", recounts Arthur. "He came up to me once when I happened to be in Berlin and, with a very sharp finger, prodded me in the stomach and said, 'One day you'll fly for me'. He kept offering me jobs flying aircraft and I kept turning them down. Of course, he bought hundreds of Percival Prentices, the biggest block in the register's history, and they were all parked out at Southend. He asked if I'd like to use one for crop-spraying. I pointed out that they were a bit too big. But he insisted on bringing one over, and it turned up at Panshanger. We all flew it and decided to have a consensus of opinion, which was, 'It's too bloody big'. The Prentice seemed to have a compensation device in it — if you flew it solo, it felt exactly the same as if you were flying at maximum weight… I knew Edgar Percival, and didn't like him very much. He was a bit bumptious."

Agricultural Aviation didn't really take off for Arthur, but more productive was a long association with the Gardan Minicab. "Yves Gardan sold me the rights when I flew down to Pau in 1956. It had rounded wingtips, which I didn't like because that encourages a stall. I altered the shape of the wings slightly, I altered the cabin to make it a bit bigger, and I produced brand-new drawings in English. I sold them for 30-40 years."

Arthur made his last flights in Luton Minors built from Phoenix plans during the early 1970s. Since then he has dedicated himself largely to writing. Dozens of books and countless magazine articles have been the result, not least for this one. He was in at the start when *Aeroplane Monthly* was founded, and he's been a fixture in our pages for most of the 50 years that have passed.

General aviation has changed out of all recognition since Arthur was actively involved. How does he view the progression of the pastime he did so much to encourage? "Really and truly, it is a confirmation of the fact that I couldn't fly today. There was no sat-nav, there was no GPS. People had maps, and you flew by the map and learned map-reading. Today I don't think people have to know anything about map-reading, with the instrumentation they have.

"What I am conscious of is that I don't think the way I used to fly would be possible now. You could fly dead-straight over Heathrow above 4,000ft. From Panshanger to the Isle of Wight you drew a straight line. Out of courtesy, I used to fly to Bovingdon, then south over Blackbushe and straight down to the Isle of Wight, sometimes meeting the famous eagle half-way down which used to formate on aircraft — and attacked one Tiger Moth… Today it's all prohibited zones and airways and God-knows-what."

You can imagine why that sounds so unappealing to a private pilot whose formative flying days were in the '50s. But Arthur was fortunate to have been around for such a comparatively carefree, almost pioneering era, one to which it's impossible to return. And that makes his memories all the more precious.



ABOVE: Revealing the elegant new LA4 Minor, G-ASAA.



LEFT: Reunited at the 2015 LAA Rally with Luton Minor G-AMAW, an interesting example in that it was awarded a permit to fly before Arthur's, but was then subject to several groundings by the authorities. STEVE SLATER

BY ROAD AND

Although it seems obvious that aircraft companies simply fly the aircraft they build, for a variety of reasons they sometimes have to be moved by other means. These photographs, selected from the archives of BAE Systems at Brough by **Steve Blee**, a heritage volunteer at the East Yorkshire site, show various machines being transported by road and sea



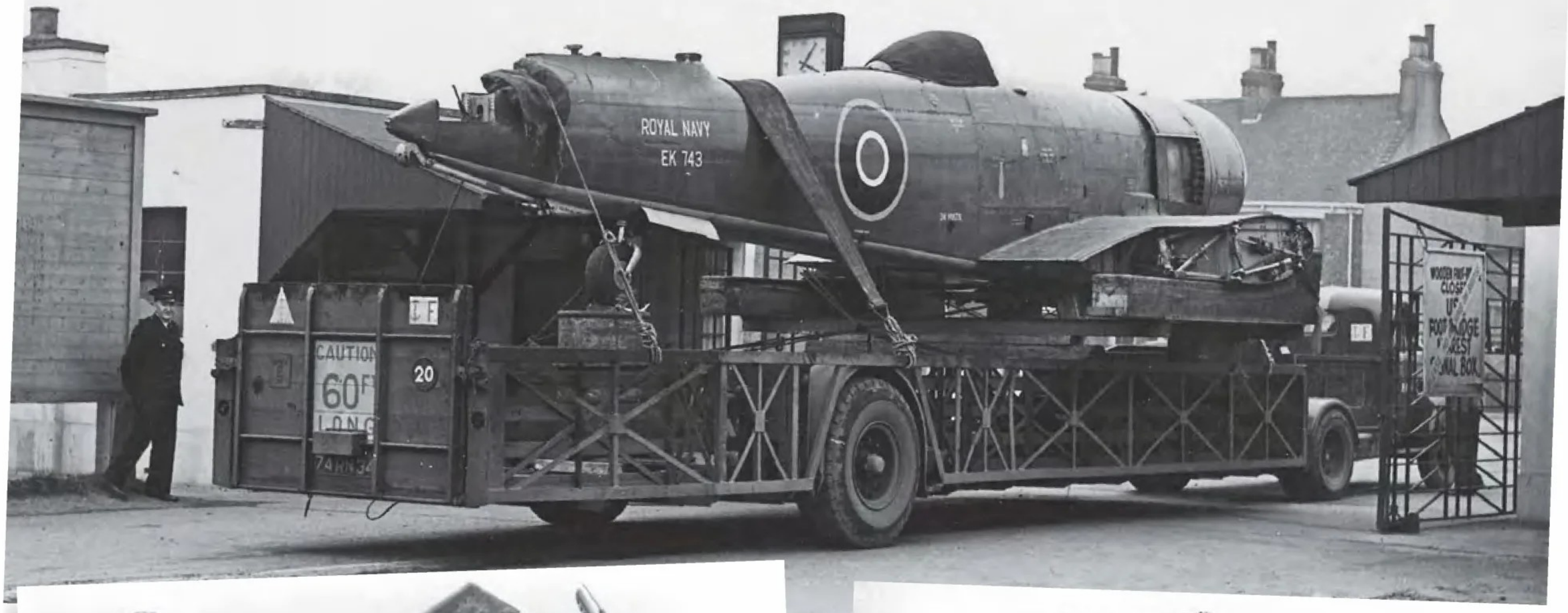
LEFT: Between 1940 and 1945, Blackburn's Dumbarton factory built 250 Sunderlands, which were flown off the Clyde. It was also contracted to produce 200 Botha light bombers. With no airfield available, the company procured a special barge, named the *Dumbrough*, which was used to move the aircraft across the Clyde to Abbotsinch for flight-testing. This is the first, L6347.

BELOW: The Blackburn NA39 prototype being transported from Brough to RAE Bedford for its initial flight-testing on 11 April 1958.



WATER...

Firebrand TF5 EK743 on 20 March 1953, the last of the type to leave Brough.





11 December 1967 saw this Buccaneer having to be recovered after sliding off the road at Cliff between Brough and Holme-on-Spalding-Moor in snowy conditions.





ABOVE: An unidentified Phantom crosses the Humber Bridge on its way to RAF Scampton during December 1983.

LEFT: After one of the first batch of South African Air Force Buccaneer Mk50s was lost on its delivery flight, the then Labour government refused to allow a replacement to be ordered. The SAAF thus decided to ship the second batch by sea, going out in two groups of four. The aircraft were towed to Hull docks and transferred by a floating barge crane before being cocooned as deck cargo for the trip south in July 1966.

Have you got photos to contribute to Personal Album? If so, e-mail the editor at ben.dunnell@keypublishing.com

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633/23



The third DH108, VW120, with the markings it carried for 1949's National Air Races. CHRIS SANDHAM-BAILEY

14 IN-DEPTH PAGES

DE HAVILLAND DH108

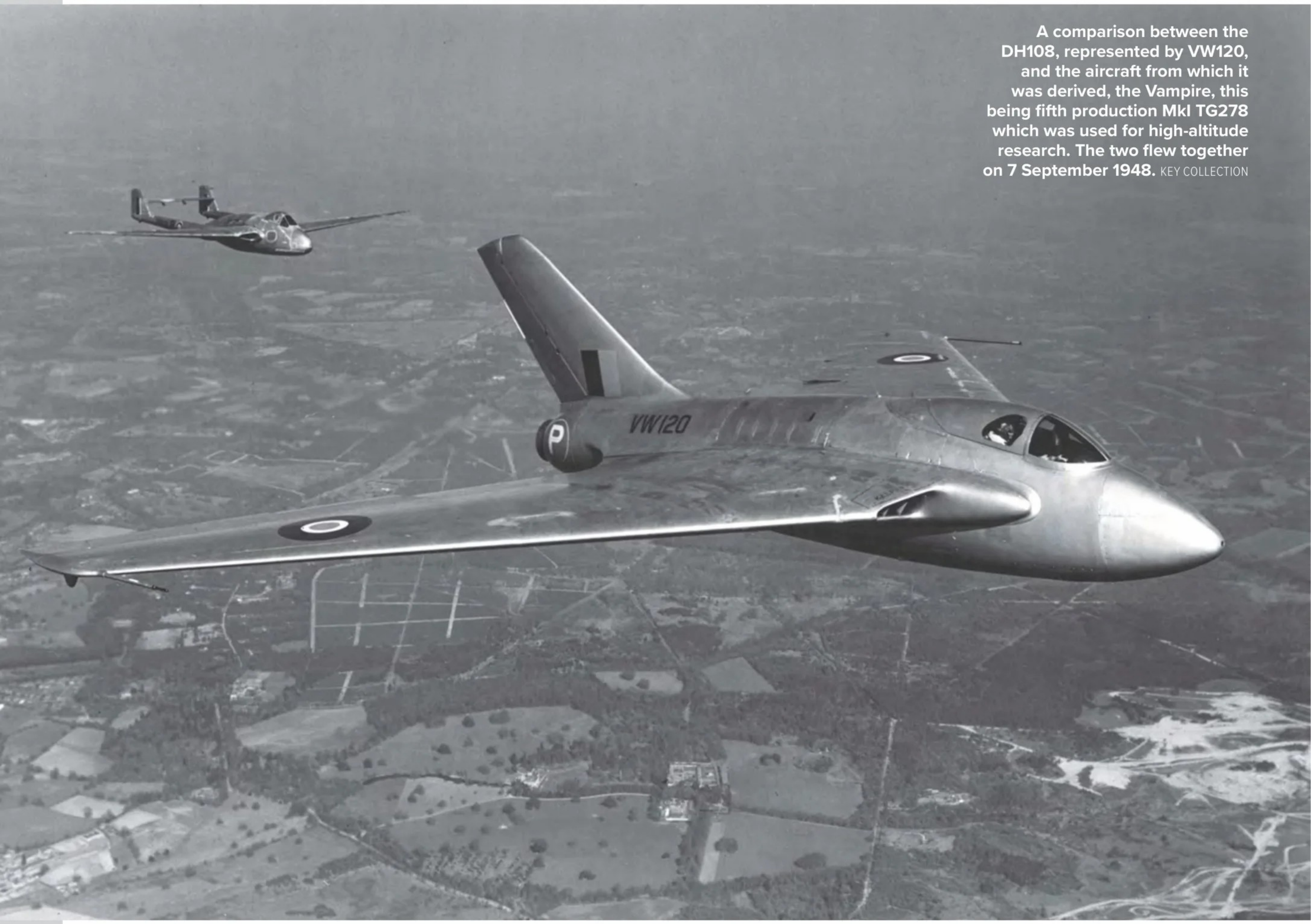
WORDS: TONY BUTTLER



VW120 allowed the resumption of the DH108's high-speed research effort. BAE SYSTEMS

DEVELOPMENT

The Vampire provided the basis for a boundary-pushing research jet



A comparison between the DH108, represented by VW120, and the aircraft from which it was derived, the Vampire, this being fifth production Mkl TG278 which was used for high-altitude research. The two flew together on 7 September 1948. KEY COLLECTION

The de Havilland DH108 is a landmark aeroplane, in that it was the first British-built high-speed research type to feature swept wings and to break through the sound barrier. However, despite achieving much in terms of providing knowledge in the supersonic field, its career will forever be clouded by tragic events that saw all three DH108 airframes destroyed in crashes and killing their pilots.

The arrival of the jet engine made higher speeds for combat aircraft possible almost immediately, but the discovery of the benefits of swept or delta wings at high speeds, instead of the old-fashioned straight wing, enabled designers to extract the maximum benefits from the new source of power. This did bring problems.

One of these, as speeds approached the supersonic region, was 'compressibility.' When an aeroplane flies at low speed, the compressibility of air around it is not a problem in relation to its design, but as the speed increases and airflow around the aircraft moves faster — and then exceeds the speed of sound — a number of new aerodynamic effects come into play. These were important to, and influenced, how aircraft would be designed.

Swept or delta wings helped nullify some of these effects, but the lack of basic knowledge of this subject during the 1940s and early 1950s made flight at or near supersonic speed an uncomfortable and most dangerous business, and many test and service pilots were to lose their lives. At sea level the speed of sound is around 760mph (1,223km/h), but this drops to circa 670mph (1,078km/h) at 36,000ft (10,973m). It was to be some time before research machines were designed that were capable of prolonged supersonic speed on the level, but pretty quickly new fighters — and then larger types such as bombers and airliners — were planned which would fly at speeds far higher than previous types, and with maximum speeds that came close to the supersonic region.

> ***"The DH108 became a vehicle for more general research"***

The objectives for the DH108 included an assessment of one new form of 'advanced' aerodynamics, in this case a swept wing with no tailplane, along with trying to obtain the highest possible performance using the jet engine. It was built purely as a research aircraft with the resulting data applicable to new military and civil types, though initially it was to have provided direct support to de Havilland's DH106 Comet, the first jet-powered airliner in the world and which, in its earliest form, was designed to have been a tail-less machine.

This new configuration was so advanced that a half-scale model aeroplane was considered necessary to look into some of the problems that might occur with the airliner's layout. Eventually, the Comet would be redesigned with a conventional tailplane, so the DH108 duly became a vehicle for more general research. Three DH108s would be built, under



DH108 TG283 outside a hangar at Hatfield. Mosquitos and Hornets stand in the distance. BAE SYSTEMS

contract number 66562 dated 13 December 1945, and the type would carry the unofficial name 'Swallow'.

de Havilland had already designed and produced Britain's second jet fighter, the DH100 Vampire, and the DH108 was to be a development of this aircraft. It was covered by specification E18/45 of January 1946 and operational requirement OR207, which detailed the design and construction of — initially — two tail-less, single-engined, jet-propelled prototype aircraft developed from the Vampire I. The machine was to have a service ceiling of not less than 45,000ft (13,716m), and the first airframe could be completed without a pressure cabin. At a later stage the de Havilland Goblin engine could be replaced by a more powerful de Havilland Ghost, though this never happened. Power assistance for the main flying controls was to be provided for the second aircraft.

To accelerate their construction process the DH108s were converted directly from Vampire fighter airframes. The first of them, serial TG283, was delivered to Hatfield on 24 September 1945 for its conversion, and work moved forward quickly. The aircraft had been fully modified by 28 April 1946 (it retained the same serial) and it began taxi trials in early May. However, the need for secrecy and ongoing runway construction work at Hatfield saw TG283 being dismantled and delivered by road to Woodbridge in Suffolk. Besides having a very large runway, Woodbridge was situated in the middle of a pine forest which would help to screen the DH108 from prying eyes.

TG283 was soon reassembled, and taxiing trials of this new and unconventional aeroplane



TG283 with what looks like Geoffrey de Havilland Jr in the cockpit. For some reason, de Havilland wrote the serial number on the rear fuselage as TG/283. PLANET NEWS



TG306 had wingtip parachute fairings in place for the September 1946 SBAC show at Radlett, where it is assumed this picture was taken. *AEROPLANE*



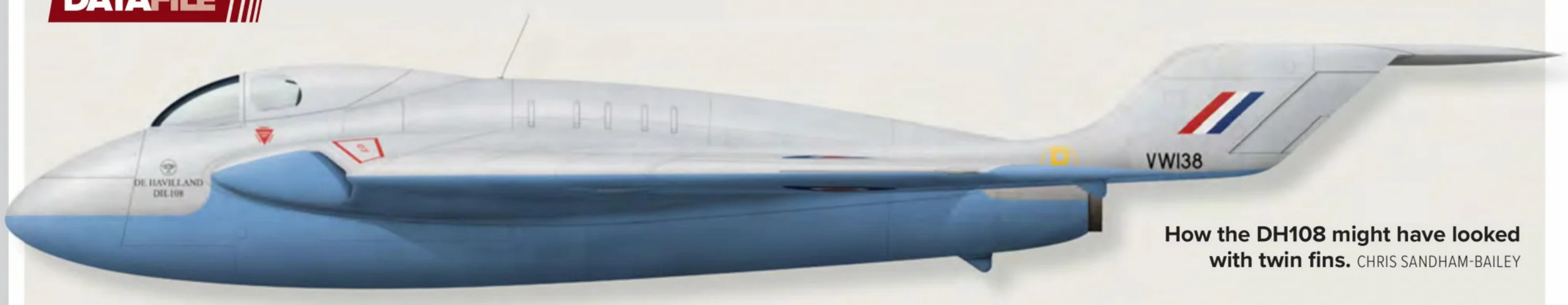
DH108 VW120 mingles at Hatfield with the first prototype Comet 1, two Mosquitos, a Vampire and Canadian-built Chipmunk G-AJVD. BAE SYSTEMS

were under way again within six days. It made its first and second flights in DH108 configuration on 15 May 1946 piloted by Geoffrey de Havilland Jr, the son of Geoffrey de Havilland Sr, founder of the company. On 28 May, TG283 was flown back to Hatfield to enable the manufacturer's trials to begin.

Vampire TG306 — like TG283, an English Electric-built airframe — was flown to Hatfield on 11 February 1946 to begin its conversion into the second DH108. It first flew in this new form on 23 August 1946, piloted again by Geoffrey de Havilland and once more flying from Woodbridge. This was to be the high-speed trials airframe.

In overall charge of the DH108 project's design was de Havilland's Richard Clarkson, but the project engineer who led the aircraft's small design team had been John Frost. The latter's achievement in merging together the front fuselage of a straight-wing aeroplane to a new, highly swept wing and vertical fin was remarkable.

DATAFILE



How the DH108 might have looked with twin fins. CHRIS SANDHAM-BAILEY

A TAIL FOR THE 'SWALLOW'?

A meeting held at the Ministry of Supply at Thames House on 15 November 1946 discussed the provision of a third DH108 prototype. Charles T. Wilkins and John C. M. Frost from de Havilland stated that their firm had proposed making provision on the aircraft's structure for the addition of a tail, should it be a desirable step. It was agreed that such provision should indeed be made, but that the actual decision for its use should be taken at a later date. A tail was never to be fitted to any DH108, but two different forms of tailplane were wind-tunnel-tested by the Royal Aircraft Establishment at Farnborough, and this research would lead to the DH110 all-weather fighter.

The resulting RAE wind tunnel report was entitled *High Speed Tunnel tests on tailplanes mounted on booms behind the DH108 Wing*, and the tests were conducted on two different types of tailplane fitted to a 1/15-scale DH108 model. This work was undertaken in January 1948 and investigated the effects of adding a tailplane to the aircraft's lift, pitching moment and drag. It showed that both types of tailplane remained effective with regard to stability and elevator control at Mach numbers up to 0.95. A tailplane with 5 per cent thickness/chord ratio and 12° sweepback was found to be slightly more efficient than one of the same volume coefficient but with 10 per cent thickness/chord ratio and 40° of sweep forward. It was also found that the booms, along with the second of these tail configurations, lowered the drag divergence Mach number appreciably. For a full-size aircraft in this configuration the wingspan would be 39ft (11.89m) and its gross wing area 332 sq ft (30.88 sq m), and for the tailplane 9ft (2.74m) and 45 sq ft (4.185 sq m) respectively. For the record, the DH110 employed a slab-type tailplane with no sweep at all.

TECHNICAL DETAILS

The airframe that took Britain through the sound barrier



The rather crude-looking canopy arrangement on TG306, with metal covering the rear portion. The commonality with the Vampire remains obvious, however. *AEROPLANE*

The DH108 was a single-seat, tail-less aircraft powered by a de Havilland Goblin II turbojet engine mounted in the fuselage and fed by air intakes set in the leading edge of the wing root. The second aircraft, TG306, received a slightly more powerful Goblin IV. The standard Vampire intake and ducting were retained. Wing sweep-back was 40° on the quarter chord line (43.75° at the leading edge) and, although it could be set at dihedral angles of -2°, 0° and +2°, for its early trials zero dihedral was retained throughout. The wing had a main spar plus auxiliary front and rear spars and contained two extra fuel tanks on each side to supplement the regular Vampire tanks in the fuselage. Wing thickness/chord ratio was 12.6 per cent at the root section, 10 per cent at the section just outboard of the air intakes and 10 per cent at the tip. For its low-speed role TG283 had fixed Handley Page slats, set in the open position, extending along the wing leading edge and over the air intakes. It was the strength of these slats, which were built in wood, that limited the allowable normal acceleration to 2.4g and the maximum speed to 351mph (565km/h). TG306 had retractable slats to permit much higher speeds.

Longitudinal and lateral control were provided by elevons, which when displaced together by fore-and-aft stick movement gave pitching control, and when operated differentially by sideways stick movement afforded rolling control. The elevons, positioned outboard right to the wingtips, had aerodynamic nose balance and an adjustable geared tab which operated for aileron and elevator movement. The tab also served as a trimmer for the elevator control. Combined landing flaps and longitudinal trim flaps were fitted inboard of the elevons. The plain trim flaps amounted to about 20 per cent of the wing chord with a range of movement relative to the chord line from 0° to 11.5° up. The landing split flap, mounted in the trim flap, was about 10 per cent of the wing chord and could be deflected 60° relative to the trim flap. Thus, with the trim flap fully up the maximum deflection of the split flap was 48.5° relative to the wing chord. Each wingtip — on TG283 only — had a 24ft (7.32m)-diameter emergency control parachute in a container or fairing to provide help with recovery should the aircraft have entered a spin.

> ***“The second aircraft received a slightly more powerful Goblin IV”***

One of the first official walk-around views of TG283, taken at Hatfield in October 1946. CROWN COPYRIGHT









Views showing each of the three DH108s banking away from their respective camera aircraft enable a comparison to be made of these machines, particularly the parachute housings on TG283's wingtips and the changes introduced on VW120 from the earlier airframes.

BAE SYSTEMS AND *AEROPLANE*

The DH108's standard Vampire I fuselage pod — the fighter's forward fuselage back to the main spar attachment — had been stretched rearwards to make room for a single fin. The pod, strengthened to take the additional stresses resulting from the introduction of a swept wing, was made in wood but the all-new additions to the airframe, namely the wings, rear fuselage, swept fin and rudder, were all manufactured in light alloy. The rudder had an adjustable geared tab and horn balance and the jet pipe was set to give a downward thrust angle of 2°. Small skids were mounted under the wingtips, together with a bump pad on the tail to give some protection when landing. Vampire undercarriages were used by all three airframes, although in due course long-stroke Sea Vampire undercarriages would be introduced to increase the ground clearance.

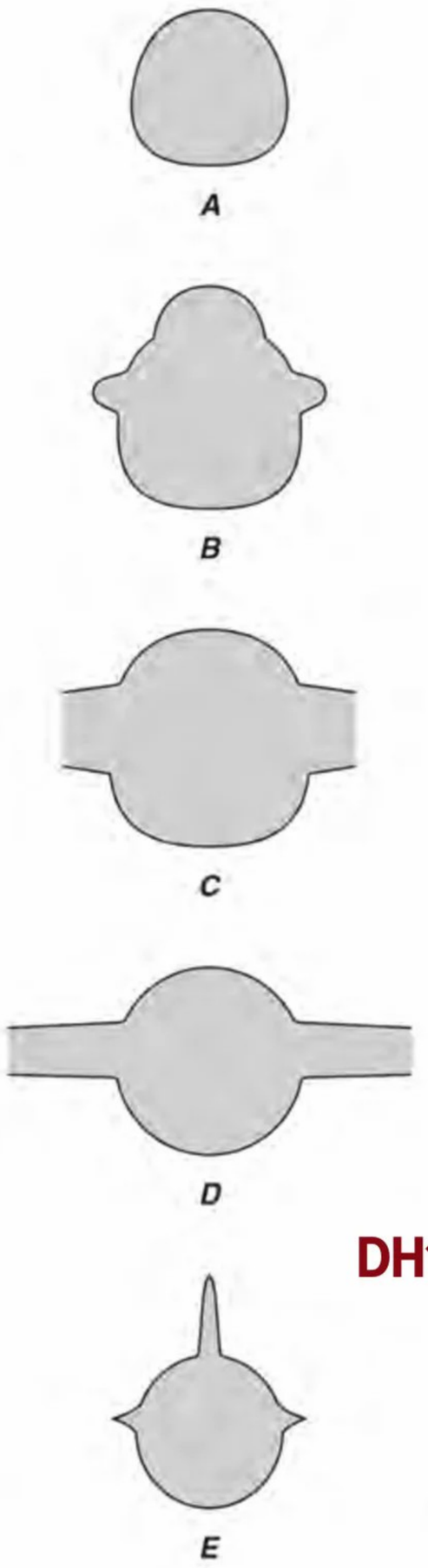
> ***"The standard Vampire I pod was stretched rearwards"***

Neither of the first two DH108s had an ejection seat, a weakness that was rectified in the third, serial VW120. There were differences in the cockpit canopy between all three airframes, and VW120, which employed a Vampire FB5 forward fuselage, also introduced a longer and more pointed nosecone, a stronger airframe and a wider canopy, a more powerful engine, power operation on the wing surfaces only (both TG283 and TG306 had manual operation) and fully automatic slats; the new Servodyne power-operated controls incorporated variable 'feel-back'. On VW120 the portion of the canopy behind the curved front section had to be removed from the aircraft for the pilot to climb in, this being replaced once he was seated.

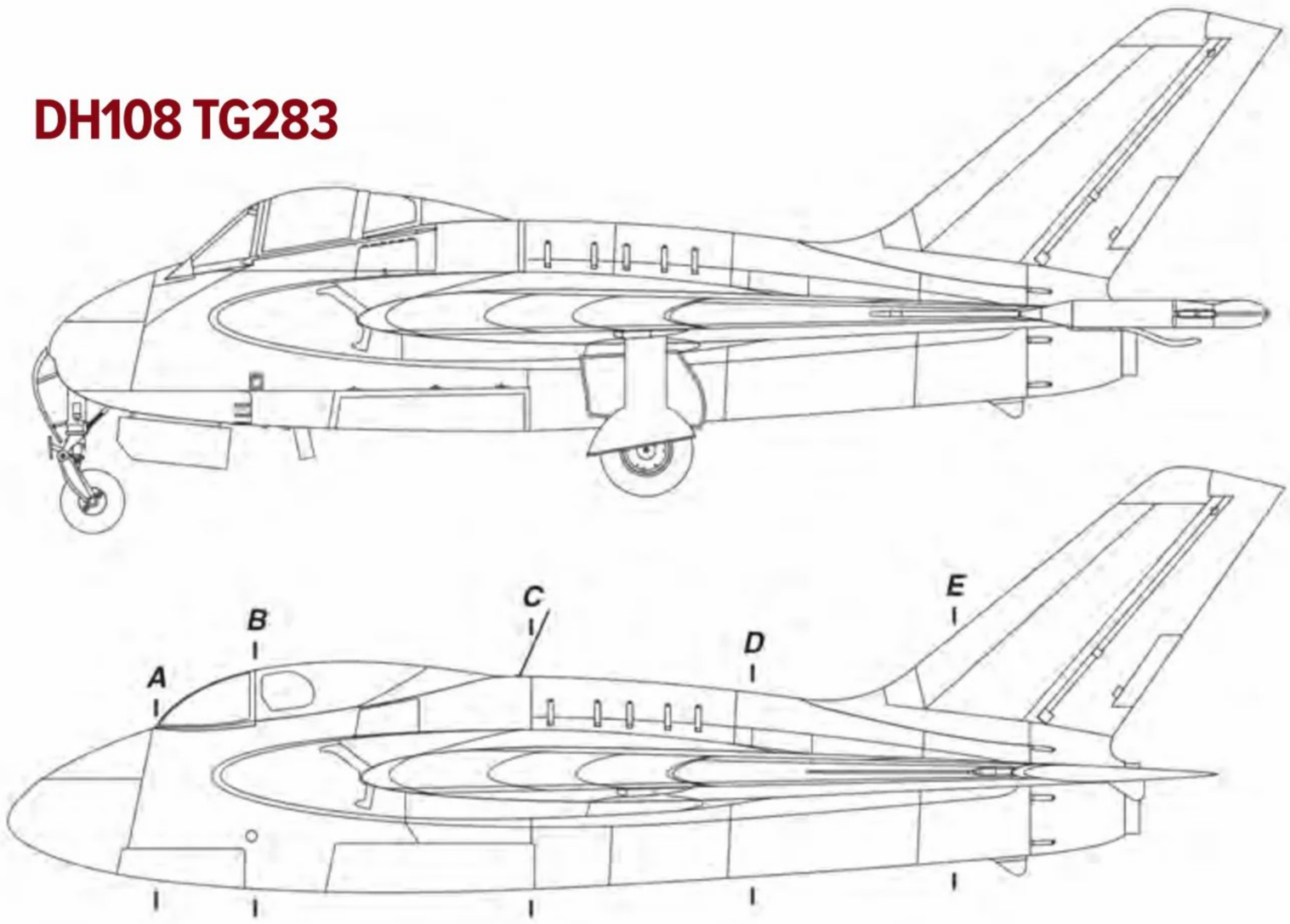
It was vital for the DH108 to have a powerful system of in-flight data-recording and the aircraft's instrumentation was created and developed by S. C. Caliendi, de Havilland's chief instrument engineer. His system could be grouped under the headings of aerodynamic tests, structural tests and powerplant assessment. For example, the control surface angles were measured by electrical transmitting gauges positioned at the nearest point to the control surface. This had proved necessary because errors would occur due to cable stretch if the position of the stick had been assumed to be a measure of the control surface angle.

DATAFILE SPECIFICATIONS: DH108

POWERPLANT	
TG283: One de Havilland Goblin 2 (D.Gn.2) centrifugal-flow turbojet, 3,100lb thrust; TG306: One Goblin 4 (D.Gn.4), 3,300lb thrust; VW120: One Goblin 5 (D.Gn.5), 3,750lb thrust	
DIMENSIONS	
Span:	39ft 0in (11.89m)
Length:	TG283: 25ft 10in (7.87m); TG306: 24ft 8in (7.52m); VW120: 26ft 9.5in (8.17m)
Gross wing area:	327.86 sq ft (30.49 sq m)
WEIGHTS	
Loaded:	TG283: 8,800lb (3,992kg); TG306: 8,960lb (4,064kg); VW120: approximately 9,200lb (4,173kg)
PERFORMANCE	
Maximum level speed:	TG283: 300mph (483km/h); TG306: 635mph (1,022km/h); VW120: 640mph (1,030km/h)
Maximum dive speed:	Just over Mach 1
Maximum altitude:	In excess of 40,000ft (12,192m)



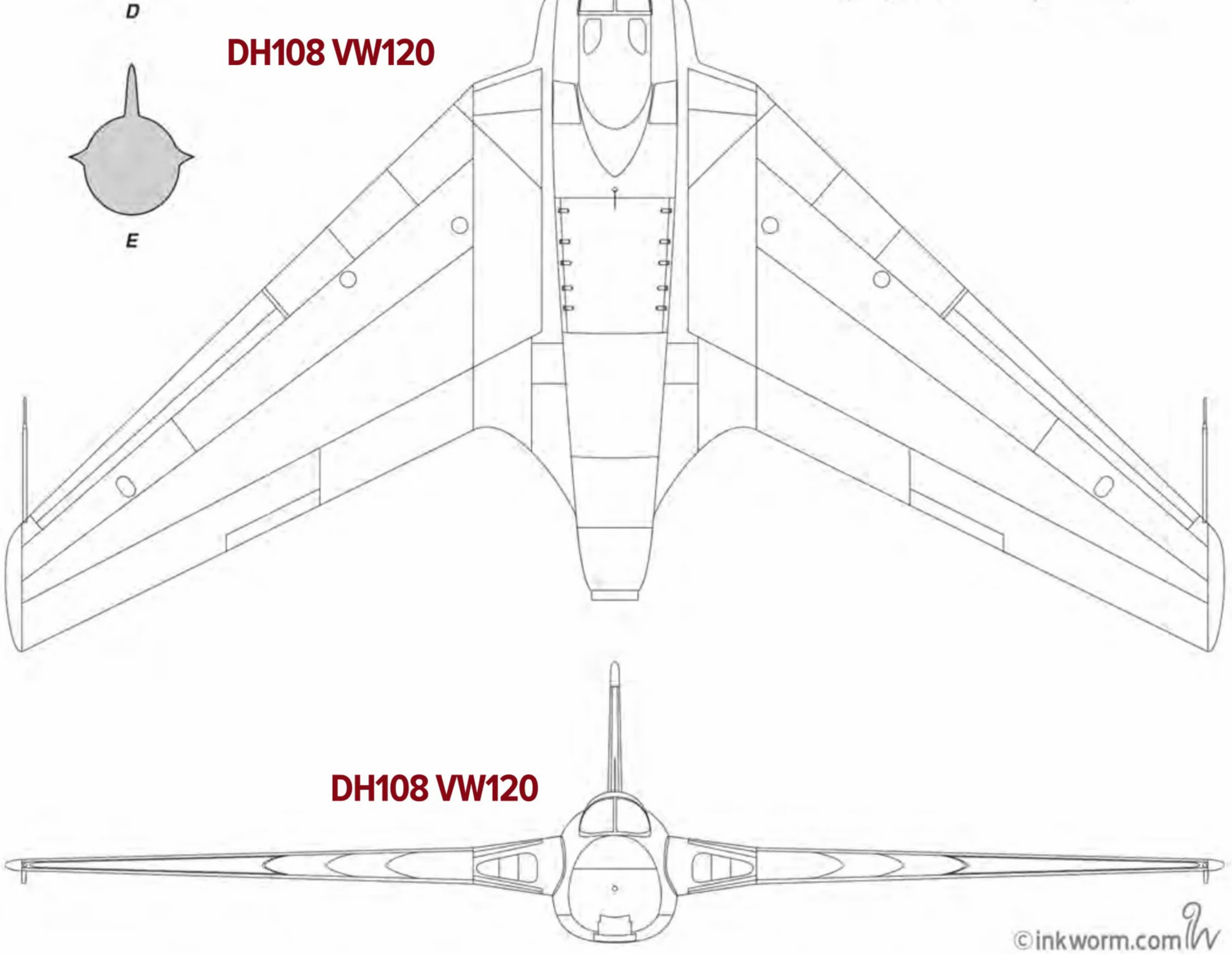
DH108 TG283



DH108 VW120



DH108 VW120



DH108 VW120



FLIGHT-TESTING

The fates of all three DH108s displayed the risks inherent in their research role



TG283 with one of the short-lived wing fences in place. BAE SYSTEMS

Geoffrey de Havilland Jr conducted all the early manufacturer's development flying with TG283, the first flights giving the opportunity to put together a general impression of the DH108's stalling characteristics and ease of landing. Indeed, right through to the middle of 1947 most of its test flights looked at stalling and rates of descent, with de Havilland test pilot Gp Capt John Cunningham taking this work on from mid-October 1946 following de Havilland's death.

By August 1947 the de Havilland aerodynamics staff had assessed TG283's stall performance and concluded that wing fences (or wing fins, as the firm preferred to call them) could be the answer. Initially mid-span fences were fitted, but these did not prevent wing drop during the stall, so smaller versions were tried. Cunningham found these were no good either, and when he was flying the DH108 at 125mph (201km/h) the machine shuddered violently and the wing fins vibrated. As a result the outboard fences were removed and leading-edge flaps adopted instead.

Progress with the high-speed trials using second aircraft TG306 was rapid, but de Havilland's pilots soon encountered compressibility at a height of 35,000ft (10,668m) and an equivalent air speed of around 340mph (547km/h) — equivalent air speed, or EAS, is a rectified figure which takes into account a correction for compressibility. One effect of compressibility was a nose-down pitching tendency which was found to be rather less violent than expected. There was also some pilot-induced oscillation, and here the lack of a tailplane did not help because its absence reduced the available damping in pitch. Then in early September 1946 the all-silver TG306 took part in the first post-war SBAC (Society of British Aircraft Constructors) Exhibition and Show which was held at Radlett, de Havilland putting in a memorable display which included slow rolls, loops and fast and very low flypasts.



A rare colour study of VW120 in August 1947, before its attendance at Radlett's SBAC display. KEY COLLECTION



Groundcrew swarm over TG283, which has protective mesh guards over its air intakes. *AEROPLANE*

The 'high-speed' DH108's performance was so impressive the design team quickly decided to attempt to break the world air speed record, then held by a Gloster Meteor with a figure of 616mph (991km/h). Consequently, TG306 was cleaned up, had its cockpit modified with more metal and less window area, and the external finish improved. On top of this the wingtip anti-spin parachutes were removed and the aircraft was repainted in a gloss grey scheme. With these modifications in place, TG306 could reach Mach 0.895. The record attempt was to have been flown out of Tangmere but once the cockpit modifications were completed, and as part of the overall preparations, a series of trial flights was conducted from Hatfield starting on 24 September.

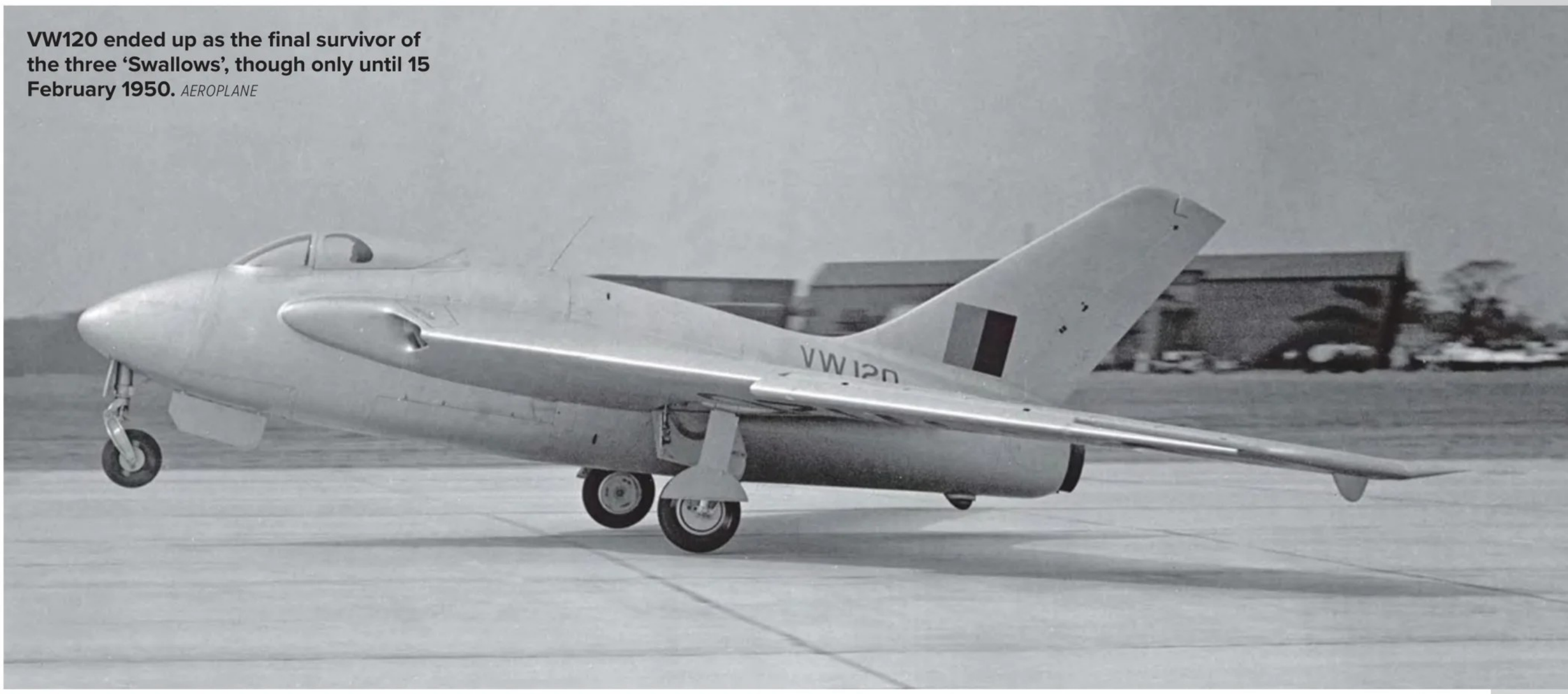
A day later de Havilland recorded Mach 0.895 in a shallow dive from 34,000ft (10,363m), though the estimated air speed was only 340mph (547km/h), and on 26 September Mach 0.86 (595mph, 957km/h) EAS at 5,000ft (1,524m). He followed this on 27 September with 636mph (1,023km/h), or Mach 0.855, in level flight at just 1,500ft (457m), which beat the existing record though it would never be officially submitted.

The next flight, number 10 in this series from Hatfield and flown during the evening of 27 September, would bring disaster. Geoffrey de Havilland Jr lost control and was killed after TG306 began to experience a powerful pitching oscillation, which caused the aircraft to break up above Egypt Bay near Gravesend. The pilot had started a dive at 10,000ft (3,048m) over the Thames Estuary, but eventually he entered a violent outside loop which caused both wings to fail under down-load.

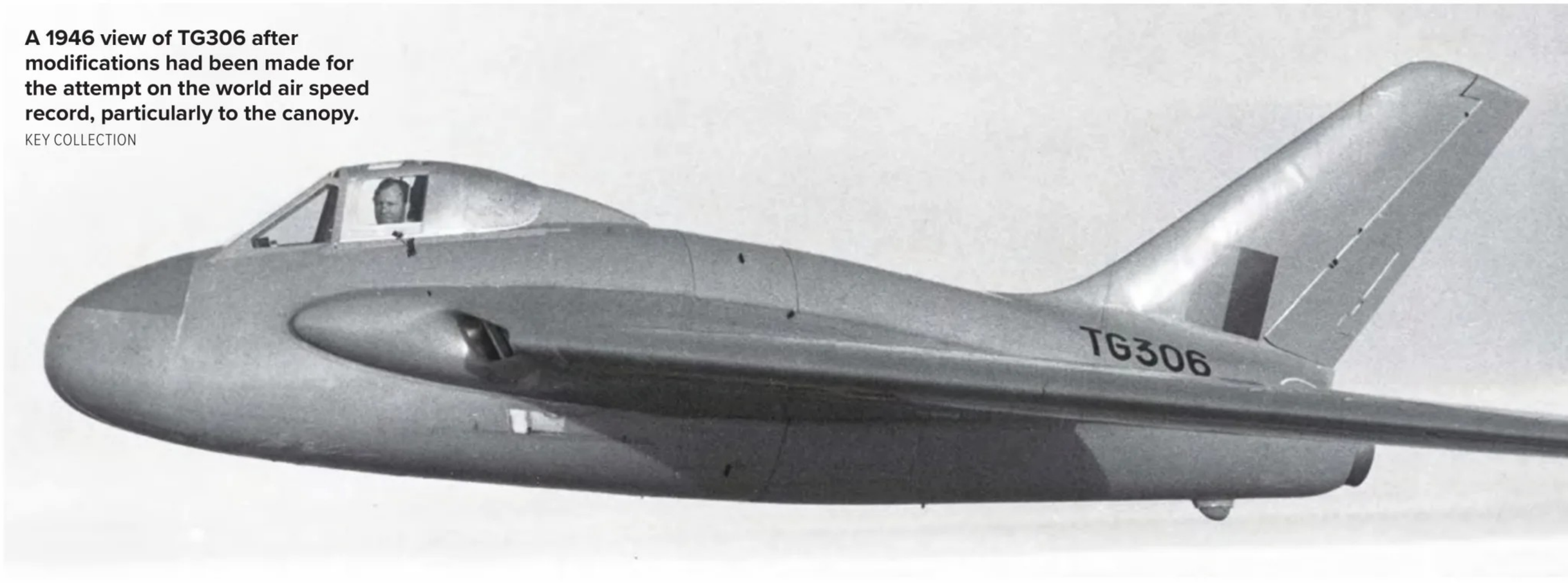
> ***"Even with this awful loss the value of the DH108 had been established"***

Calculations indicated that before TG306 had begun to break up it had reached around 580mph (933km/h) EAS, Mach 0.87, in a shallow dive at about 7,000ft (2,134m) altitude, a combination of Mach and EAS greater than anything that had been recorded before.

Further tunnel testing revealed the DH108 had experienced a loss of elevon effect in the pitching plane when flying at high Mach numbers and that this later changed to a reversal of control, accompanied by a nose-down change in trim and reduced longitudinal control. TG306's total time-in-air in its DH108 form, up to the point of take-off on flight 10, came to just 13 hours in 21 sorties. Nevertheless, even with this awful loss the value of the DH108 had been established and so a third example, serial VW120, was ordered. John Cunningham piloted this aircraft on its maiden flight on 24 July 1947. In an effort to counter the weaknesses discovered through the analysis of TG306's crash, the new aeroplane incorporated the modifications and



VW120 ended up as the final survivor of the three 'Swallows', though only until 15 February 1950. *AEROPLANE*



A 1946 view of TG306 after modifications had been made for the attempt on the world air speed record, particularly to the canopy.
KEY COLLECTION

improvements outlined previously.

Returning to TG283, the base for an official low-speed flying programme undertaken between October 1948 and May 1950 was to be the Royal Aircraft Establishment at Farnborough, and the aircraft was flown from Hatfield to Farnborough on 6 October 1948 by Capt Eric Brown. These RAE trials with TG283 came to an abrupt end with another fatal crash, which is described later.

The arrival of VW120 enabled the manufacturer to begin flight trials at high speeds again. Gradually the maximum figure was raised, in increments, to ever higher levels. The pilot, who had taken over after the loss of Geoffrey de Havilland Jr, was Sqn Ldr John Derry. He undertook almost all the flying in VW120 from this point until the aircraft was passed over to RAE Farnborough's control in June 1949. For example, on 18 February 1948 he recorded Mach 0.86 at 37,000ft (11,278m) and on the 19th Mach 0.88 at the same height. Derry used VW120 to set a new 100km closed-circuit speed record on 12 April 1948, at an average of 605.23mph (973.8km/h).

For this attempt VW120 was entered jointly by the Ministry of Supply, which owned the aeroplane, and de Havilland Aircraft. Since Derry had performed the great majority of the recent development flying in VW120, John Cunningham, de Havilland's new chief test pilot, gave him the opportunity to go for the record. However, Cunningham himself flew a weather reconnaissance sortie in a Vampire prior to the DH108's record flight.

The nominated course was to be just one lap of a circuit which started and ended over the BBC radio mast at Brookmans Park. There were four turning points: Puckeridge radio mast north of Ware, a brickworks near Three Counties station at Arlesey, a cement works at Upper Sundon close to Luton, and a point south-west of Beechwood House at Markyate. Derry duly completed this route in just six minutes 9.6 seconds, which easily beat the figure set previously by a Supermarine Attacker naval fighter. The highest indicated speed during his flight was 635mph (1,022km/h), approximately 15mph (24km/h) short of the world speed record. The DH108 was again showing real promise.

On 13 May 1948, Derry began another flight that was intended to be a foray into high indicated air speeds and Mach numbers. Having put VW120 into a gradual dive from 8,000ft (2,438m), at 6,000ft (1,829m) he reached Mach 0.875 with just a very slight nose-down change of trim. But at 4,500ft (1,372m) and 625mph (1,006km/h) VW120 hit a spot of bumpy air which started a wild up-and-down pitching and uncontrollable bucking movement. Shutting the throttle did not seem to help, but when the speed had dropped to near Mach 0.85 this violent behaviour suddenly ceased and flight became smooth again. It was later realised that Derry slamming the throttle shut very quickly had prevented VW120 from breaking up in the same way as TG306 had done earlier. Analysis suddenly made it clear what must have happened to Geoffrey de Havilland in TG306 — he could never have encountered this instant and vicious runaway pitching in his career before, and so had no chance at all of controlling it before his DH108 began to disintegrate.

> ***"It became something of a bucking bronco, out of control"***

Returning to the trials programme, on 16 August 1948 Derry recorded Mach 0.94 during a dive from 42,000ft (12,802m). Much of the effort at this time concentrated on pressure plotting and control and stability, in addition to the investigation into a problem with pitching oscillation. However, flights at high speed and altitude revealed a loss of roll control at Mach 0.99 and insufficient pitch control at Mach 0.97, so never-to-exceed Mach number limits were now placed on the DH108, dependent on the aircraft's attitude, when flying at Mach 0.81 at sea level up to Mach 0.97 at 40,000ft (12,192m).

These problems became manifest in the flight which made VW120 famous on 6 September 1948, when in a steep dive from 45,000ft (13,716m) Derry lost control until his aircraft had reached 23,500ft (7,163m). He was then able to regain control and get the aircraft back into level flight. During the descent a speed of Mach 1.04 indicated was recorded, so the DH108 had become the first British aeroplane to break through the sound barrier, but a lot more had happened during this dive.

VW120 had initially experienced pitching oscillation at Mach 0.94, before the aircraft tipped over the vertical. For the pilot, it became something of a bucking bronco, out of control. At one stage, with the Mach meter having reached 1.04, Derry could not get the aircraft out of this dive and was losing height at a most alarming rate. Fortunately, he tried using the trim flaps and, after applying full up-flap, VW120 at last gradually began to pull out of its descent, before at Mach 0.98 the pull-out became more pronounced and the elevons began to bite. Despite another period of severe undamped oscillation, moving the trim flaps again, to neutral, calmed everything down. Derry was no doubt very relieved to get back to Hatfield. This epic dive had lasted no longer than one

minute, in a sortie of around 35 minutes.

Follow-up calculations for instrument error would amend the speed achieved by VW120 to Mach 1.02, but Britain had at last become a member of the 'supersonic club'. It had also become the world's first supersonic aircraft able to take off and land under its own power, since the first aircraft to exceed a Mach number greater than unity, the Bell X-1, needed to be released from a carrier aeroplane. The DH108 could now take its place in aeronautical history.

Flight magazine for 16 September 1948 reported, from a conversation with Derry, that the historic flight had taken place at about 10.00hrs in the clear morning of 6 September, between Farnborough and Windsor. On this trip Derry had no firm intention of attempting to break through Mach 1, and instead had the declared purpose of collecting more data at speeds above Mach 0.96. The published piece made no reference to the complete lack of control in the dive, but Derry added that no buffeting had been experienced at this time and there was no instability, excepting that which might have been manifested with the tightening-up of the controls.

The American publication *Aviation Week*, in its issue for 20 September, took pains to emphasise that the DH108's dive performance was no match for the 700mph (1,126km/h) level flight, at heights between 30,000ft and 40,000ft (9,144m and 12,192m), of the standard production swept-wing North American F-86A fighter, nor the Mach 1.4 and 1,100mph (1,770km/h) accomplishment by the straight-wing X-1 rocket research aircraft. In truth, the F-86A could not reach anything like 700mph at these heights, though on 26 March 1948 the first X-1 had recorded Mach 1.45 at 71,900ft (21,915m). This article added that Derry had worn a pressure waistcoat and used an oxygen mask for the flight, since the DH108's cabin was not pressurised, and he had revealed "that he does not believe the airplane capable of sonic speed in level flight."

Indeed, after John Derry had first broken through Mach 1, de Havilland designer Richard Clarkson told *Flight* the DH108's airframe had not been "designed to withstand the loads of supersonic flight in the dense air at low altitudes". Clarkson went on to say it was not proposed to install a de Havilland Ghost turbojet in place of the specially rated Goblin engine because, although this might have made Mach numbers above 1 possible in level flight, very extensive modifications to the airframe would have been required in order for it to cope.

> ***"John Derry was powerless to stop what was happening"***

John Cunningham displayed the record-breaking VW120 to the public at the SBAC Farnborough show on 11-12 September 1948. The aircraft itself would make just one more supersonic flight, in another dive on 1 March 1949. Here, the flight characteristics proved to be quite different.

In a dive from 44,000-45,000ft (13,411-13,716m), set at about 35°, the aircraft's behaviour was normal up to Mach 0.97. However, when Derry pulled the stick back to level out it proved unsuccessful and the DH108 continued its dive. Eventually the port wing dropped, which made it become even steeper. Use of the up-trim flap had no effect either and VW120 continued to head earthwards, now at an angle of more than 60°. An uncontrollable roll to the left put the aircraft into a true vertical descent and Derry was powerless to stop what was happening. On reaching Mach 1, the DH108 went into an outside loop until it was completely inverted, and then rolled slowly until the aircraft was level laterally. Now in a shallow dive, the aircraft began to respond to its controls once more and Derry was eventually able to level VW120 off at a height of 29,000ft (8,839m).

A first flight of VW120 with power boost added to the aileron function of the elevons to help improve lateral control took place on 25 April 1949. Derry reported afterwards that the "handling has become pleasant and there is a feeling of much better control over the aircraft at 580mph (933km/h) and above". The record-breaking VW120 was passed into RAE Farnborough's hands on 28 June to begin a trials programme to assess the aircraft's high-speed stability and control, though on 1 August it was released for a few days to take part in the National Air Races at Elmdon. But on 15 February 1950, VW120 crashed at Brickhill near Bletchley, killing its pilot, the RAE's Sqn Ldr Stewart Muller-Rowland. The aircraft disintegrated in the air as a result of a descent at high speed from about 27,000ft (8,230m), but the reasons for the crash and why Muller-Rowland never ejected have never been fully established.

On this flight Muller-Rowland had a target height of 38,000ft (11,582m), but it was later calculated he could not have reached more than 27,000ft (8,230m). The first part of the airframe to fail had been the outer portion of the port wing, followed by the starboard wing breaking away from its root. This destruction of the DH108 had started at a height of between 9,000ft and 10,000ft (2,743m and 3,048m) and finished between



Geoffrey de Havilland Jr checks his watch prior to a DH108 test flight. GETTY



VW120 at Elmdon on 1 August 1949 for the National Air Races, where the aircraft experienced an undercarriage door failure. *AEROPLANE*

6,000ft and 7,000ft (1,829m and 2,134m). In all, VW120 had accumulated 122 hours 25 minutes in the air.

In reaching a maximum of Mach 0.98 during a flight on 8 July 1949, RAE test pilot Eric Brown had experienced runaway divergent longitudinal oscillations, which resulted in two important restrictions being imposed for the future DH108 flight test programme. Firstly, the indicated in-flight Mach numbers were now limited to 0.87 at 25,000ft (7,620m) and Mach 0.85 at 10,000ft (3,048m), while the pilot was not permitted

> ***"Eric Brown experienced runaway divergent longitudinal oscillations"***

to alter his flight path angle at high altitude and an indicated Mach number exceeding 0.90, once he had committed to a specific angle. The objective here was to prevent any longitudinal oscillation or violent accelerations from being induced.

The RAE's Chris Capper completed a large amount of research flying in TG283 during 1949 and 1950 to assess the DH108's overall handling qualities, work which resulted in the low-speed performance report from Farnborough referred to in the Insights section. It looked closely at the DH108's approach and landing characteristics, both in calm and in turbulent air, its longitudinal and lateral stability and control, plus some general performance tests. Some of these flights, in October-November 1949, had involved partial glides. But on 1 May 1950 the low-speed DH108 became the final casualty when it crashed on a flight out of Farnborough.

After performing a stall with the flaps down at 15,000ft (4,572m), TG283 went out of control and entered an inverted spin. The anti-spin parachutes did not operate properly — one of them did stream but the second failed to open — so the pilot, Sqn Ldr George Genders of the RAE, prepared to escape. A partial recovery was apparently achieved at around 2,000ft (610m), before the aircraft entered a normal spin and crashed near Hartley Wintney. Even with no ejection seat, Genders managed to get out, but he was killed when his parachute failed to stream in the height that was left to him. TG283 had completed 135 hours' flying as a DH108.



Condensation appears to envelop VW120 in a dive approaching Mach 1. KEY COLLECTION

DATAFILE

'SWALLOW' SERIALS

Both TG283 and TG306 retained their Vampire serials, though when first ordered in 1945 they had been allotted the new serials VN856 and VN860. These were cancelled in February 1946 and the retention of the originals may have been due to the fact that these aircraft were classed as modified or refurbished airframes. VW120 was a new allocation, but it was applied just two weeks before the aircraft took to the air.

DH108 pilots had to run the gauntlet of some difficult flying characteristics



With its longer, more pointed nose, VW120 was the most graceful of the three DH108s. *AEROPLANE*

An RAE report, not issued until September 1952, gives a good idea of what it was like flying the DH108 at low speeds, the all-up-weight during these tests being about 8,200lb (3,720kg). The document noted that when taxiing the aircraft was very similar to the Vampire with an excellent view out of the cockpit, though being so close to the ground did mean care was required to avoid any obstacles. However, the Goblin II appeared to have poor thrust response, so prior to take-off the aircraft was held on the brakes until full static thrust was obtained. In a crosswind there was a slight tendency to swing during the early part of the run, but this could easily be counteracted by braking.

When a speed of 100mph (161km/h) had been reached the nosewheel was raised, but the take-off itself was delayed until 115mph (185km/h) because the DH108 would pitch nose-up on leaving the ground. In very gusty conditions some rudder was needed, though the take-offs were made without flaps, and when the undercarriage was finally raised there was negligible change of trim.

Handling tests were conducted through the speed range from 90-280mph (145-451km/h). Regarding control characteristics at lower speeds below 140mph (225km/h), the report noted that the elevator was rather heavy and moderately effective, the ailerons were light and fairly effective but the rudder was very light and extremely ineffective, and the effectiveness of all three controls deteriorated as speed was decreased towards the stall. Below 115mph (185km/h), coarse stick movements were necessary to keep the wings level in bumpy weather.

Medium turns at 190mph and 220mph (306km/h and 354km/h) up to the maximum of 2.4g showed no abnormality of control. Entry and recovery from turns could be made on aileron alone with rudder fixed, but using just the rudder with aileron fixed the movement of the aircraft became "very jerky". A steady flat turn at 220mph (354km/h) with full rudder required half-opposite aileron but gave no particular nose or tail-heaviness. The forces involved were not excessive although the aileron load was fairly heavy.

A quick displacement and then release of each control when flying at 220mph (354km/h) showed that, when this was done with the aileron, the stick barely self-centred, which gave a lateral oscillation superimposed on a turn. The rudder would return to the central position again fairly slowly while a poorly damped directional oscillation was induced.

Due to the dihedral effect of the swept wing, the motion included a rolling oscillation whose amplitude appeared to be greater than that of the yawing oscillation. In fact, when flying in rough air at any speed, the aircraft developed this lateral oscillation or 'Dutch roll', which had to be corrected continuously on all three controls, and became extremely tiring to the pilot. At 280mph (451km/h) there was no vibration or buffeting. The stick force per g was considered high for this type of aircraft.

Stalls were made at one centre of gravity position with the aircraft in three configurations: flaps up, undercarriage up, trim flap neutral; flaps up, undercarriage up, trim flap up; and flaps down, undercarriage down, trim flap up. The pilot's report stated that with the engine throttled fully back, speed was reduced very slowly towards the stall. The aircraft was stable stick-free from 140mph down to 125mph (225-201km/h), the trimmer being wound slowly nose-up as speed was reduced. At 130mph (209km/h) the aircraft was in trim, below 125mph (201km/h) it was slightly unstable stick-free, and by 86mph (138km/h) the trimmer had been wound forward to 6° nose-up. In spite of calm air, the aircraft was 'Dutch-rolling' about 3° either way throughout the approach to the stall. The ailerons seemed particularly ineffective near the stall and it was not found possible to damp out the 'Dutch roll' with either rudder or aileron.



John Derry takes off in VW120 prior to setting a new 100km closed-circuit speed record on 12 April 1948. BAE SYSTEMS

At about 86-85mph (138-137km/h), without warning, the right wing would drop by about 40°. In addition, it was found that if the wing was held up with aileron the aircraft suddenly snapped over to the right through 90° of bank. Any delay in taking recovery action would involve the aircraft rolling onto its back, and a lot of height could be lost in the ensuing dive.

The characteristics of the stall with flaps, undercarriage and trim flap up proved similar, except for a slight buffet on approaching the stall. With flaps down, undercarriage down and trim flap up, a slight lateral shaking of the stick started at 145mph (233km/h). This continued down to 105mph (169km/h), where it died out. At 145mph (233km/h), with the trimmer wound fully nose-up to 15°, a mild pull force was required for trim down to 90mph (145km/h). Again without warning, the aircraft nosed-up suddenly at 84mph (135km/h) and the right wing dropped by about 40°, more violently than in the flaps-up stall. A moderate push force of about 20lb (9.1kg) was required on the stick to initiate recovery, which was straightforward except that an unpleasant 'Dutch roll', involving 30-40° of bank each way, would develop.

When it came to the high-speed end of the performance spectrum, John Derry compiled a report summarising the flight-testing he had accomplished in VW120 between 18 February and 16 November 1948, and which was published in full in Brian Rivas's book *A Very British Sound Barrier*. As built, the aircraft had proved to be heavy on all of its controls when flying at around 350mph (563km/h) indicated air speed. The maximum rate of roll was slow when compared with fighter standards of the day, and the removal of the nose balance on the elevons had made the DH108's lateral control too heavy for rolling manoeuvres of any kind. Primarily due to their heaviness, the elevons themselves were "not crisp", though the machine was, of course, not designed for fighter-type manoeuvres.

> ***"The rate of roll was slow compared with fighter standards of the day"***

As described earlier, over a seven-month period the Mach number at altitude had been gradually built up, but each step was repeated on several occasions to make sure an accurate all-round picture of what was happening in the air was available to the design team and pilots. With the elevons in their original configuration, the first signs of compressibility had been experienced at Mach 0.85 in the form of just a nose-down trim change, which gradually built up at speeds between Mach 0.85 and 0.87. For the initial flights at these Mach numbers there was no power boost in place and the build-up became rapid between Mach 0.875 and 0.885, so it was vital to fit power boost before any further flights at such speeds. It was in due course discovered that, by using an even minimum feel-back of 35 per cent on the power boost, it was possible to handle VW120 quite satisfactorily at low indicated air speeds when flying at around 40,000ft (12,192m).

The initial flights flown to a maximum of Mach 0.89 saw the appearance of slight snaking and 'Dutch rolling', particularly in turns when small angles of slip and skid were present, and this was damped very weakly. As a result the rudder trailing edge was modified, which cured this problem, and it became possible to make turns at Mach 0.88 without any unusual characteristics; however, 1.5g to 2g could not be employed thanks to concerns about the DH108's behaviour at higher Mach numbers and at Mach 0.88.

The DH108 was without doubt a dangerous aircraft to fly, as a crash and fatality rate of 100 per cent will testify, but that is not the full story. Perhaps the tail-less layout was an example of how not to do things, but the three aircraft had, over four years of flying, provided a great deal of lasting and valuable information for the aircraft industry as a whole. And it had become Britain's first aeroplane to reach supersonic speed. Maybe we can say the DH108 was a partial success in that it achieved major advances in swept-wing and supersonic knowledge, while showing far more needed to be learned about aircraft structures and aerodynamics, in particular for those types designed for high-speed flight. A



The turning performance of the DH108 was not outstanding, but it was, of course, never intended for tight manoeuvring. VIA TONY BUTTLER

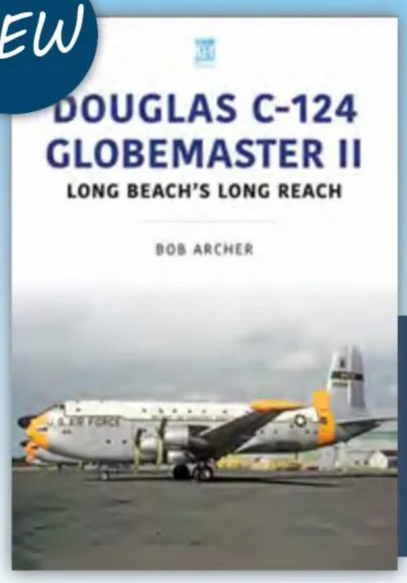
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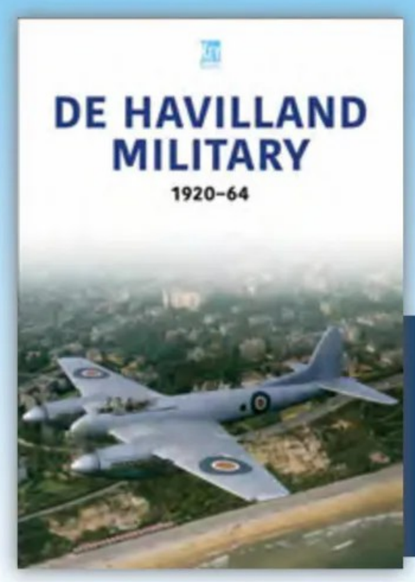
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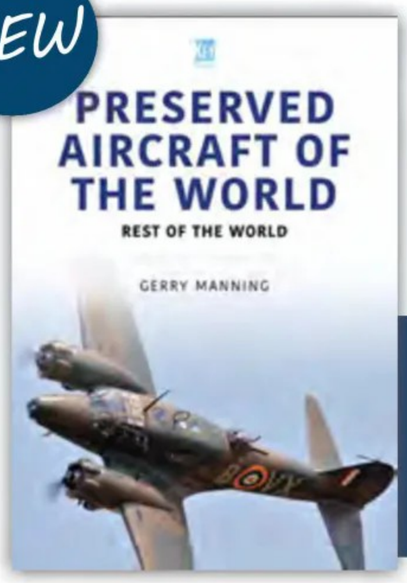


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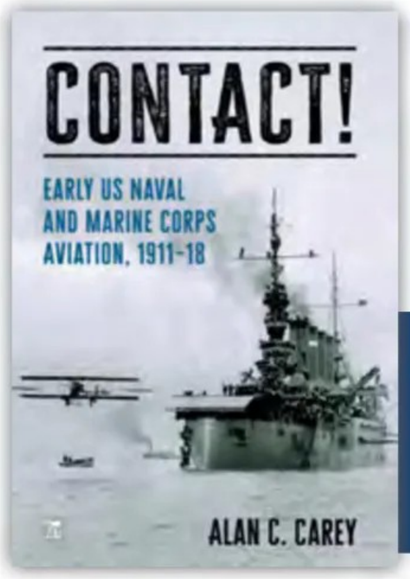
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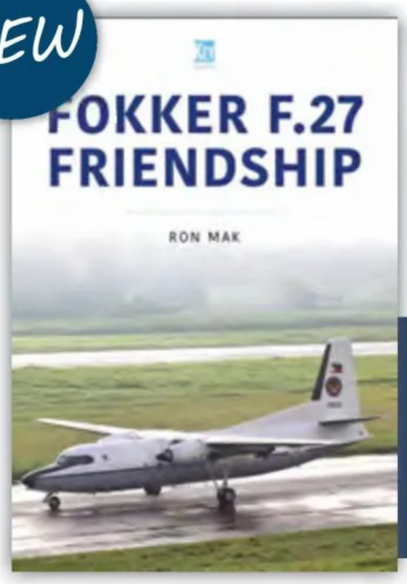


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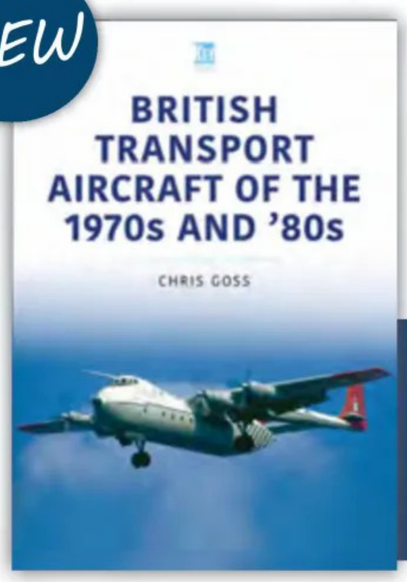


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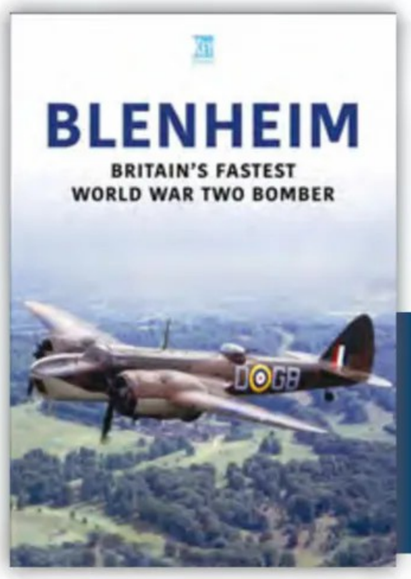
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★★★★★ Outstanding
★★★★☆ Excellent
★★★☆☆ Good
★★☆☆☆ Flawed
★☆☆☆☆ Mediocre
Enough said

The latest books for the discerning aviation enthusiast

On Wooden Wings

compiled by Andrew Jarvis
published by the Vintage Glider Club



This year marks the 50th anniversary of the Vintage Glider Club, and it has produced this landscape-format volume in celebration. In fact, as is stated in the foreword, it's more akin to a large magazine than a book, but the result is arguably better for it, being one of those nice publications that offers plenty of information and detail, yet can be dipped in and out of at will.

The contents comprise mini-chapters — 'articles' might be more appropriate — on different aspects of the VGC's history and that of the gliders owned by its members worldwide. Some have appeared before, others have been specially written. What they all have in common is the vibrant portrayal of just how splendid an activity vintage gliding is. There are flying stories, memoirs, restoration tips — even a selection of franked mail that's been flown in these types, and much more. Naturally it's a pleasure to read accounts by greats such as Anthony Goodhart, about a remarkable flight from Paris to the Pyrenees with a Breguet 905, and Derek Piggott, on reaching 17,000ft in a Slingsby T21. But there are some fascinating tales from other quarters. The reviewer was taken by the history of Yugoslav designer Adrian Kisovec and his beautiful Ikarus Košava, which placed first in the two-seat class at the 1954 World Gliding Championships. So unexpected was its triumph that the British organisers didn't have the Yugoslav national anthem to hand for the podium ceremony, so the country's delegation resorted to singing an a capella version.

If any criticisms are to be made, in places the text and captions would benefit from a much better sub-edit — especially, with all due respect to the authors, in those contributions from those who do not have English as a first language — while a few of the images have been blown up larger than their resolution allows, leading to pixelation. But these points detract little from a charming miscellany, and a fitting tribute to the VGC's jubilee. ***Ben Dunnell***

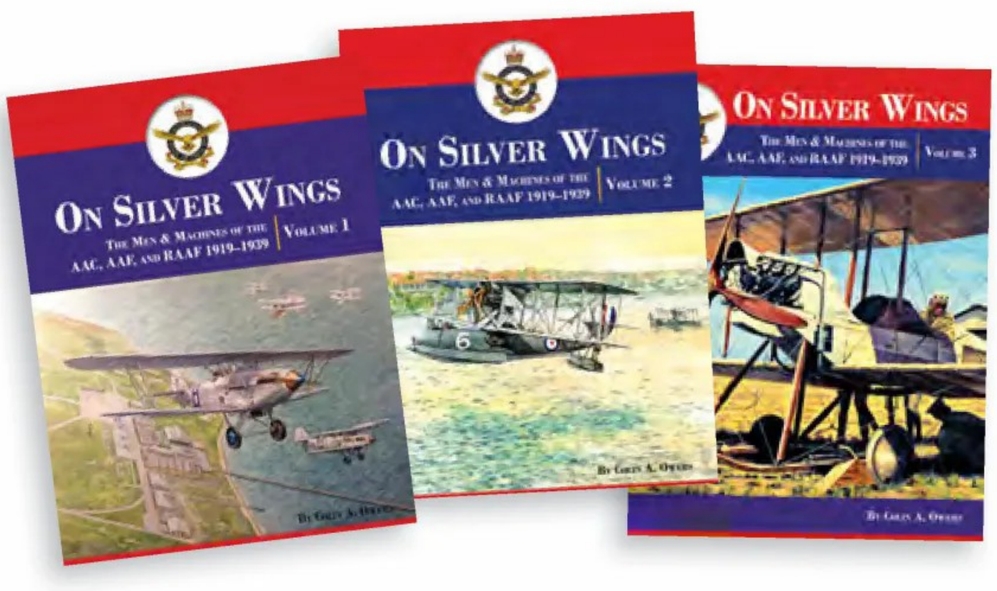
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by Colin A. Owers
published by Aeronaut Books

Over three very sizeable volumes, renowned historian Colin Owers here details the aircraft types operated by the Royal Australian Air Force and its forerunners during the inter-war years — and there were a lot of them. Owers started work on this project a quarter of a century ago, but only recently found a publisher. That timeline meant he was able to interview numerous veterans of the period while they were still around, and their recollections add colour to the text. Crucially, no space is wasted giving broader historical background on each type — this can, after all, be found in countless other places. The focus does not deviate from their Australian procurement and service, as is only right and proper. After an introduction, the aircraft are dealt with in alphabetical order, starting in volume one with the Avro 504K and finishing in volume three with the Westland Wapiti. In each case, a complete fleet list accompanies the narrative, providing detailed service careers for all airframes.

The design and paper quality leave something to be desired, but the publisher operates on a 'print on demand' basis, so allowances must be made. There are lots of accompanying photos, their reproduction acceptable if not aided by the paper stock, while Juanita Franzi supplies first-class side-view artworks, as always. Above all, as much information as one could ever need on the topic is to hand, and that's the important aspect. Very impressive indeed. ***BD***



ISBNs 978-1-953201-65-2, 978-1-953201-66-9 and 978-1-953201-67-6; all 11 x 8.5in softbacks; 310, 349 and 312 pages, illustrated; **£50.71** *from amazon.co.uk, except volume three at* **£50.31**
★★★★

Flying Tiger Archives: Volume 1 1945-1965

by Guy van Herbruggen
published by Astral Horizon Press



There is much to be said for the high-quality 'photo album'-type book that makes no pretensions at being a definitive reference, and here we have an excellent example. In fact, though, it does serve to tell an historical tale, so wide is the selection of images depicting the first 20 years of the Flying Tiger Line. This famed freight and passenger carrier, set up by former members of the American Volunteer Group — the 'Flying Tigers', hence its name — operated an extremely wide selection of types during this period, beginning with the unusual Budd RB-1 Conestoga and running through to the Canadair CL-44 and Boeing 707. All are documented, backed up by suitably specific captions.

A title such as this lives or dies on the basis of its image reproduction, and a uniformly superb standard is exhibited. The selection of photos contains countless

highlights, the magnificently vivid selection of colour Constellation shots being a particular delight to behold. Guy van Herbruggen has either written or co-written a couple of previous volumes on the Flying Tiger Line, one on its DC-8 operations, the other featuring the memories of those who worked for the company; this book acts as a suitable companion to them. One would presume from the 'Volume 1' tag that the series will be completed by a second edition, taking the story through to the Flying Tiger Line's 1989 absorption into Federal Express. If so, it is to be eagerly awaited. ***BD***

ISBN 978-1-7396630-3-2; 9.25 x 9.25in softback; 274 pages, illustrated; **£25.00** *from theairlineboutique.co.uk*

★★★★

Combat Aircraft 150: Spitfire Photo-Recce Units of World War 2



by Andrew Fletcher
published by Osprey

In the 150th instalment of Osprey's Combat Aircraft series, author Fletcher examines the operations of the relatively small number of RAF (also US Army Air Forces and Soviet) photo-reconnaissance Spitfires and the disproportionately important role they played in several theatres of war. The text is suitably detailed, while photos are decently reproduced and the 11 pages of colour profiles of Spitfires, mostly in overall blue/grey, are well up to Osprey's normal high standard. ***Denis J. Calvert***

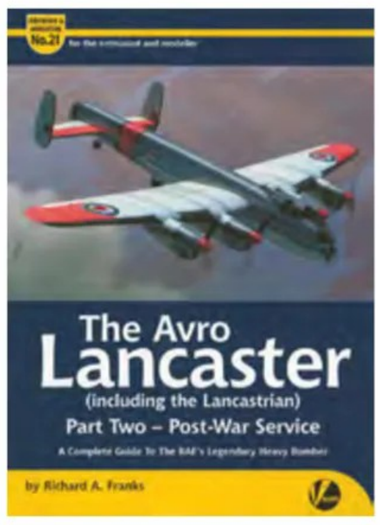
ISBN 978-1-4728-5461-2; 9.8 x 7.3in softback; 96 pages, illustrated; **£16.99**

★★★

Airframe & Miniature No 21: The Avro Lancaster Part Two

by Richard A. Franks
published by Valiant Wings

Part one was reviewed in the June edition of *Aeroplane*. Now, following on close behind is part two, which covers the Lancaster's post-war service, the civil conversions and a whole family of Lancastrian 'airliners' which really amounted to little more than a bomber airframe with turrets faired over and with a few windows in the side of the fuselage, aft of the main spar. Many pages are given over to the various test uses to which the Lancaster was put. Here you will find details of Flight Refuelling's PB972 which was modified as a tanker, initially using the hook-and-hose method (deemed too difficult and potentially dangerous) and then the more familiar hose-and-drogue system. Lancastrians served as engine testbeds, mounting a pair of R-R Avons that replaced the outer Merlins — 'two burning and two turning', as the Americans might say.

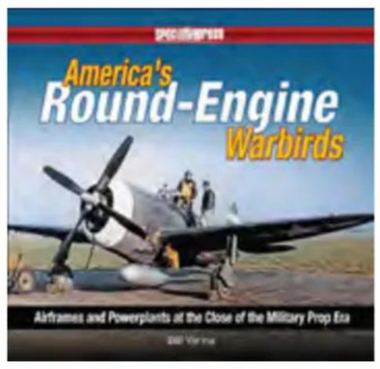


Everything which we noted in the review of part one applies equally here. This is good stuff and covers, in some detail, an unseen side of the Lancaster. Photos and drawings are of the publisher's usual quality, and there's a pull-out set of 1:72-scale plans at the back of the volume to delight modellers. ***DJC***

ISBN 978-1-912932-33-7; 11.7 x 8.3in softback; 272 pages, illustrated; **£28.95**

★★★★

America's Round-Engine Warbirds



by Bill Yenne
published by Specialty Press

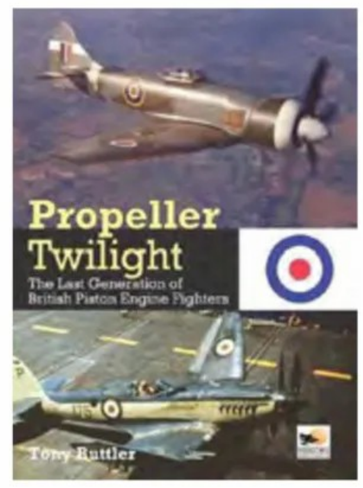
The title is a bit of a misnomer, for in referring to 'warbirds' it might be expected to focus on preserved historic machines, but in fact the term is used for the types themselves. As for the subject matter, the development of aero engine technology during the World War Two period is an undeniably significant and fascinating one, but this reviewer was left cold by its treatment here, the body text seeming to concentrate more on the evolution of the main aircraft types powered by each featured engine, with the powerplants themselves almost of secondary importance. And the structure of the book does not lend itself to a coherent narrative forming in the reader's mind. Illustrations are plentiful, and the detailed diagrams excellent, but the layout is unattractive.

One glaring error comes in the form of what seems to be confusion between the Wright R-1820 and Pratt & Whitney R-1830, manifested in such ways as a caption on page 76 referring to a Dauntless flying along "With its Wright R-1820-29 Twin Wasp humming" — Twin Wasp should here read Cyclone — and, most obviously, the title of Chapter 4, 'Wright's Remarkable R-1830 Twin Wasp'. While an editor can be forgiven for not picking up every mistake in a specialist text, these ought to have jumped out. Coupled with the book's broader shortcomings, what could be a worthwhile volume is something of a let-down, especially at just under 40 quid. ***BD***

ISBN 978-1-58007-279-3; 9.25 x 9.3in hardback; 216 pages, illustrated; **£39.95** *from crecy.co.uk*

★★

Propeller Twilight: The Last Generation of British Piston Engine Fighters



by Tony Buttler
published by Crécy Publishing

Well, here's a coincidence: another book examining the end of the piston-engine era, though in this case the emphasis is much more specific than in the title covered by the preceding review, focusing as it does solely on fighters, and the type-by-type presentation conducive to a better read. The chapters on each aircraft are, however, preceded by overviews of engine and propeller development, which set the scene well. Many of the aeroplanes featured have been the subject of dedicated individual volumes in the past, but here Buttler concentrates on their development; the operational careers of those that entered service — and not all of them did — fall outside his scope. Instead, he draws extensively on flight test and evaluation reports, with many of which the reader may not be familiar. Alongside the likes of the Martin-Baker projects, the last of the Spitfire/Seafire line, the Fury/Sea Fury and so on, Australia's Commonwealth Aircraft Corporation CA-15 and the Argentinean IAe 30 merit inclusion owing to their British engines, as do Sweden's Saab J 27 and the F+W N-6 from Switzerland, which were never built.

Reproduction varies rather significantly; quite a few of the black-and-white images look very 'flat' and lack contrast, the spread of DH Hornet shots on pages 62-63 being a definite case in point, though the period colour photos are superb. A curious anomaly sees the spelling 'propellor' used on the back cover, but 'propeller' elsewhere, while the index is somewhat cursory. But, generally, this is a title of high quality, and well worth the purchase price. ***BD***

ISBN 978-1-80035-273-5; 12 x 8.5in hardback; 248 pages, illustrated; **£34.95**

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Kingfisher FN735 on recovery to HMS Emerald in the Pacific c1943

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Events



Nick Smith in TF-51D *Contrary Mary* chases Steve Jones aboard Buchón 'Yellow 7'. A classic airshow dogfight. MIKE SHREEVE

Old Buckenham Airshow

In the adverse environment airshow organisers have found themselves in for the past few years, with many long-established fixtures disappearing from the calendar altogether, it is heartening to report on one that is going from strength to strength. Old Buckenham in Norfolk produced its strongest line-up yet for this year's two-day show while retaining the atmosphere of a community event, with much of the crowd made up of families in contrast to some of the more enthusiast-orientated affairs. This is especially heartening in the Norfolk and Suffolk area, where the population's strong affinity with aviation goes back to the war years, thanks to the numerous US bases in the locality, and continued throughout the rest of the 20th century via the number of military airfields that held well-attended annual air displays. Old Buckenham is, sadly, now the only regular airshow remaining in the region. The old-school feel extended to the dulcet tones of Ken Ellis on the microphone.

Old Buckenham once echoed to the sound of US Army Air Forces heavy bombers, in this case B-24 Liberators of the 453rd Bomb Group whose members included Hollywood actors Jimmy Stewart and Walter Matthau. It was therefore appropriate that one of the headline acts was B-17G *Sally B*, flown with gusto by Peter Kuypers. A warbird-heavy bill included a considerable quantity of other Duxford-based aircraft, one of the highlights being a dynamic display by the Aircraft Restoration Company's Blenheim in the hands of John Romain, it being very encouraging to see him back to form so soon following a landing mishap in Wildcat G-KINL at Heveningham Hall three weeks earlier. Another excellent routine was provided by a trio of Spitfires. After several flybys in vic, they split into a pair consisting of the IWM's MkIa N3200, with Jon Gowdy at the controls, and Steve Jones in the Old Flying Machine Company MkIX MH434 giving a polished demonstration of formation aerobatics, interspersed by Martin Overall's solo in PRXI PL983. After last year's popular Spitfire-versus-Buchón dogfight, this time we were treated to a similar showpiece by Nick Smith in TF-51D Mustang *Contrary Mary* from Fighter Aviation Engineering, inevitably gaining the upper hand over Steve Jones and the ARC's Buchón, which finished trailing smoke from its built-in system.

A rare appearance of the ARC DHC-2 Beaver gave Martin Overall an opportunity to demonstrate the type's manoeuvrability and slow-speed handling, allowing attendees to compare and contrast the type's characteristics with the Lysander, under the command of Jon Gowdy, which followed. Old Buckenham regular Nigel Willson flew one of the based Beech D17s alongside Peter Kuypers in his ex-Robs Lamplough example, multiples of 'Staggerwings' remaining an uncommon sight in the UK nowadays.

The organisers managed to secure a display by the RAF Red Arrows — on the



Spitfires N3200 and MH434 head into the blue. MIKE SHREEVE



John Romain put on a sparkling show in the Blenheim. MIKE SHREEVE

29-30 JUL

Saturday — for the first time this year, as well as appearances from the Typhoon, Lancaster and Falcons parachute team. Returning for the third season in succession, Christophe Simon performed lovely, lyrical aerobatics in the Tiger Club's CAP 10, and the Tiger Nine, temporarily reduced to seven aircraft, added the requisite Moth content to the afternoon's proceedings. Old Buckenham continued its reputation for attracting new acts, the Mono Display Team providing a change of pace as the next item on after the Red Arrows on Saturday. It featured a pair of diminutive VW-powered Taylor Monoplanes flown by Ben Gilmore and Bruce Buglass.

Sadly, after Saturday's largely dry afternoon allowed a full display to take place, Sunday's inclement weather caused several cancellations. This should not detract from what was another highly successful weekend for Old Buckenham, and long may it continue to host events of this scope and quality.
Mike Shreeve



Sally B **over a former 8th Air Force bomber base never ceases to stir the emotions.** MIKE SHREEVE

Vintage Glider Club 50th Anniversary International Rally

29 JUL - 6 AUG



The 1962-vintage Slingsby Skylark 4 BGA 1063 was flown by the Polish Air Force Association Gliding Club at Lasham and carried the 'Kościuszko' badge of No 303 Squadron, markings which have now been replicated. DAVID WEEKES

Founded in 1973 with the aim of preserving and flying vintage gliders, the Vintage Glider Club now comprises some 800 members worldwide who between them own more than 1,000 such machines. An international rally is held annually, its location moving around Europe. In 2022 the event was in Slovenia, and for 2024 it will be in Lithuania. As the founding rally was organised at Husbands Bosworth in the UK, it was thought essential for the 50th anniversary to also be UK-based. The Cotswold Gliding Club therefore hosted proceedings at Aston Down airfield, near Stroud.

Some 200 VGC pilots and crews were in attendance with 70 gliders from 15 different countries. Several good soaring days were experienced despite mixed weather. The main interesting arrivals on the scene were Markus Klemmer's Scheibe L-10 Libelle from Germany and David Underwood's yellow Kirby Kite, VD218/BGA 327, both of which have been beautifully restored. ***David Weekes***



The Oberlerchner Mg 19 Steinadler was one of three mounts brought to the rally by the Gliding Heritage Centre at Lasham. DAVID WEEKES

IWM Duxford Flying Evening

26 AUG

Now in its third year, Duxford's Flying Evening for 2023 seemed a lower-key affair than its previous two editions, and the all-important skyscape was rather dull for most of the two-hour programme thanks to a stubbornly motionless bank of cloud. Once The Fighter Collection's P-36C and P-40F had opened the show, followed by B-17G *Sally B*, most of the light disappeared. Nevertheless, there were some fine moments, such as an elegant solo by Martin Overall aboard Spitfire Ia N3200 in the very still air, and the Catalina's stately passes, lights ablaze, as darkness approached. Kenneth Aarkvisla's aerobatics in the Norwegian Air Force Historical Squadron Vampire FB6 were excellent, the harmonic whistle of its Goblin engine making it the perfect jet participant for such an occasion. The true stars were Tim and Tom Dews with their Grob G109Bs, LED lighting and pyros galore, performing in front of the moon. ***Gordon Renchard***



Airborne Pyrotechnics' Grob G109Bs dance in the moonlight. BEN DUNNELL

IWM Duxford 'The Americans' Flying Day

28 JUL

Duxford's third flying day of the season was held on a Friday, this to make possible participation by today's US Air Force aircraft from nearby Mildenhall and Lakenheath. There was a good variety of types on the flightline and a wider-than-normal range of stalls on the airfield, including one from the Bottisham Airfield Museum ("open Wednesday and Sundays in season") appropriately sited alongside Comanche Fighters' P-51B *Berlin Express*.

The USAF did indeed make an appearance, with a Mildenhall-based 352nd Special Operations Wing MC-130J Commando II and CV-22B Osprey overflying at 11.30, followed an hour later by two F-15Es from Lakenheath's 492nd Fighter Squadron. Come the start of the flying display proper, the home team of B-17G *Sally B*, piloted by Peter Kuypers, and P-47D *Nellie B*, flown by Stu Goldspink, opened the show. In the rest of a fully 11-item programme, highlights included four L-4 Cubs flying together energetically, followed by two Cessnas: an imaginative pairing of 170B N2366D with Bird Dog G-JDOG in French Army markings. Lockheed 12A G-AFTL made another welcome appearance alongside Spitfire PRXI PL983. The show was closed by a routine by three of The Fighter Collection's Curtiss Hawks — Brian Smith in the P-36C, Stu Goldspink aboard the P-40C and Nick Smith at the controls of the P-40F.

Yes, the weather could have been better, but the event was a sell-out and, say it quietly, this was the most ambitious Duxford flying day yet staged. ***Denis J. Calvert***



Close Cessna relatives team up, namely 170B and Bird Dog, flown by Alex Lewton and Matt Pettit. BEN DUNNELL

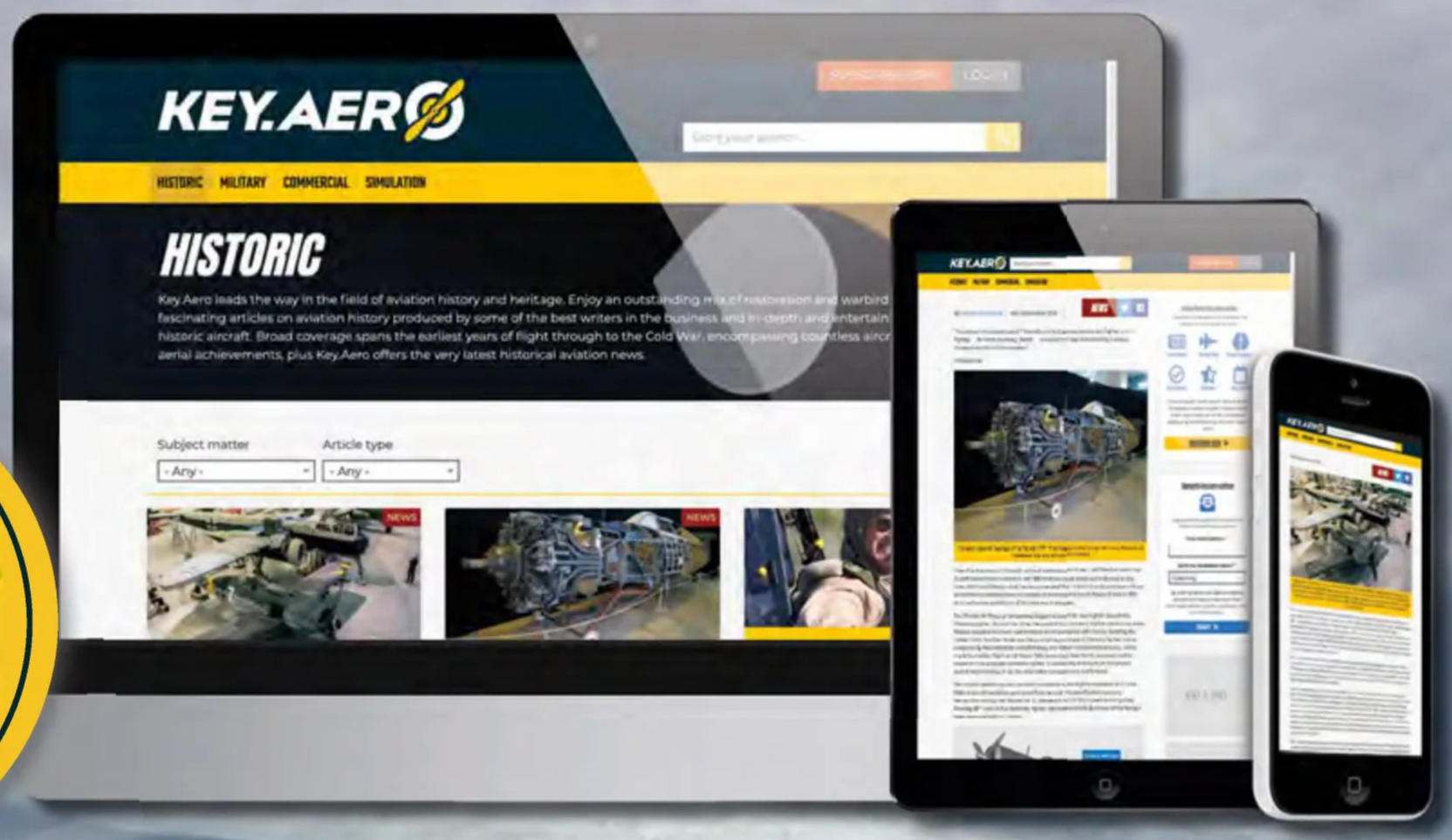
Americans abound: as the Lockheed 12A and AAF-marked Spitfire XVI RW382 manoeuvre on the flightline, the four L-4 Cubs parade in the distance. KEITH GASKELL

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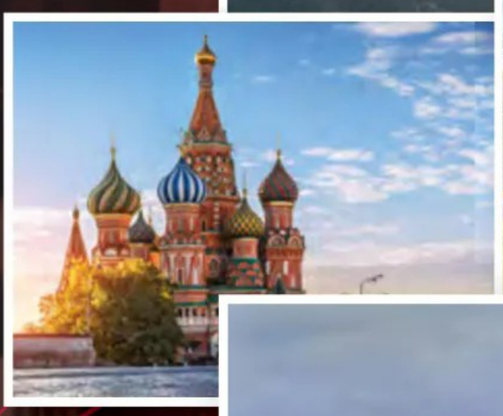
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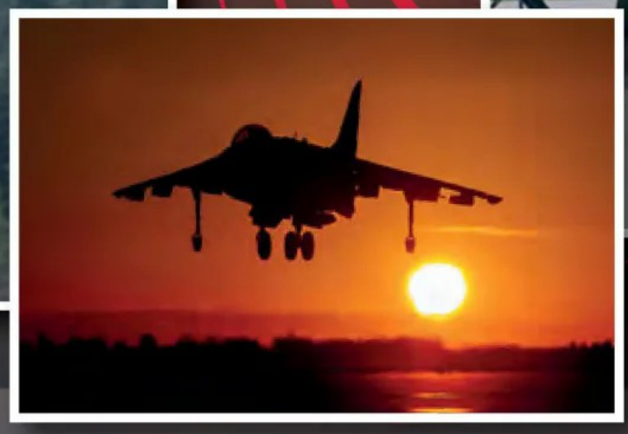
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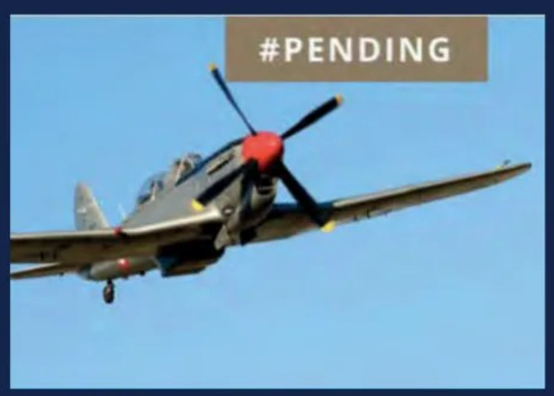
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